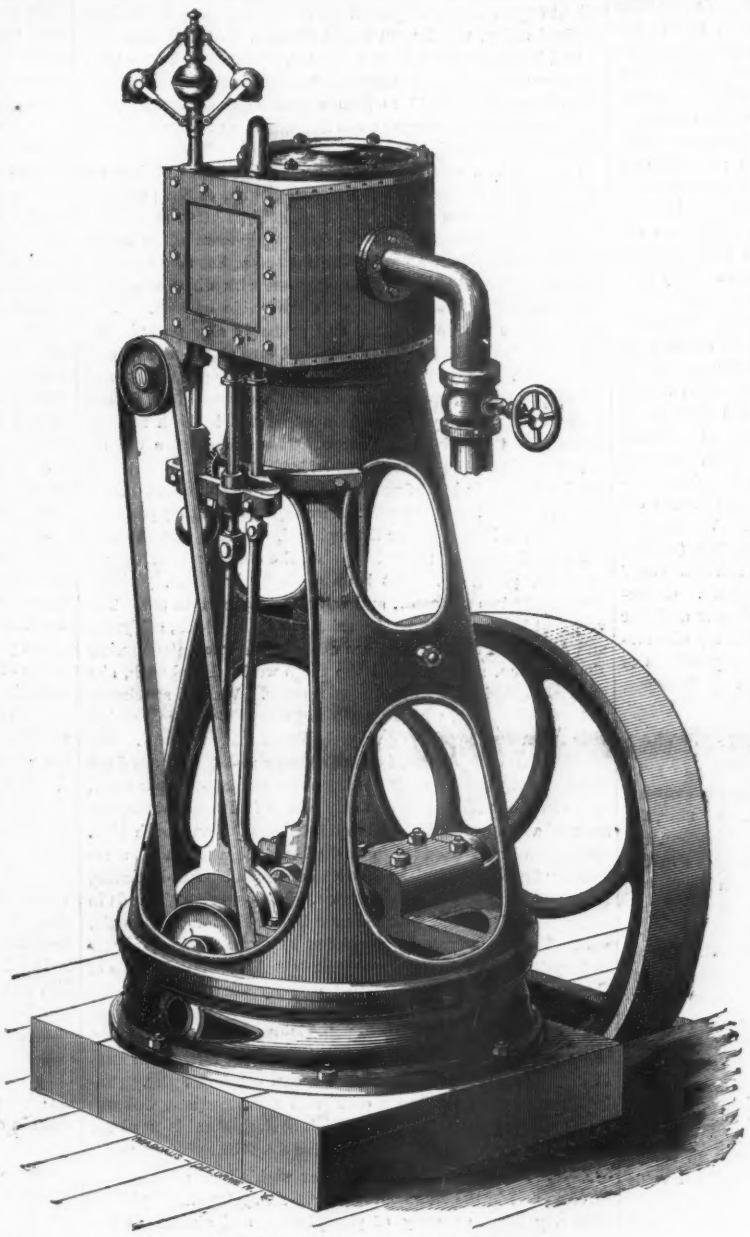
THE ENGINEERING AND MINING JOURNAL.

VOL. IX.—NO. 3.—THIRD SERIES.] NEW YORK, TUESDAY, JANUARY 18, 1870. [SINGLE COPIES 10 CENTS.

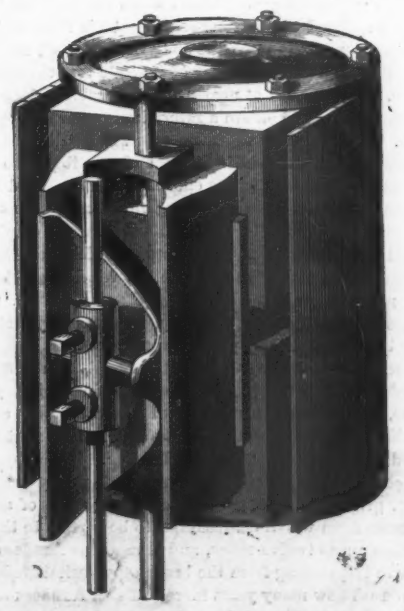
## The Rider Vertical Engine.

THE importance of using steam expansively is so generally conceded, that there is no longer any room for discussion on this point. Now and then, we find men who stand ready to deny the value of a good cut-off; but so, too, men have been found to deny the first principles of geometry and the plainest axioms of physics. And if it has happened that men with this obliquity of mechanical vision have sometimes occupied high positions in the service of the State—Chief Engineer of the Navy, for example—still this is not to be wondered at, nor does it prove any thing. No man can possibly be so ignorant or stupid that he is unfit for a government position. We have had a Postmaster General so ignorant of natural history as to deny that a nut is a seed; a Commissioner of Agriculture who did not know that hydraulic presses do not depend for their power upon screws; judges who have denied that birds are animals; and men in every position who firmly believe that whales are fish. But, on the whole, we prefer the general common sense and experience of mankind to the special crotchets of the few, and the weight of opinion is most decidedly in favor of the employment of a good cut-off. The only difference of opinion is in relation to the excellence of the mechanical arrangements employed to secure the desired result. Most of the cut-off valves employed are too complicated, and hence they are adapted only to the largest class of engines. In the engravings which illustrate this article, however, the reader will find a representation of a form of cut-off valve which is remarkable for its simplicity and efficiency. The following description will, with the aid of the engravings, render its construction and operation perfectly clear:

In short-stroke engines, where the ordinary three-port valve is generally in use, the main slide valve is, in its action, and in the form of its face side, similar to that of the well-known slide-valve, with the exception that its ends are lengthened to admit of steam-ports or openings being formed outside of the valve proper. These openings or ports are, *on the face side of the valve*, rectilinear and rectangular to the motion of the valve, that is, they run parallel with the ports in the cylinder or disposed *square* across the valve-seat. On the *back* of this main valve, where the cut-off valve is fitted, these steam-ports are *oblique*, and at opposite angles to each other, the use of which will be presently explained. The cut-off valve is a sector of a cylinder, with its ends cut off obliquely in opposite directions; so that the extremities, or acting ends of the cut-off valve respectively, conform to the lines of a right and left-hand screw of high pitch, corresponding to the obliquity or angle of the steam-ports in the back of the main slide-valve. This cut-off valve just described is fitted into a semi-cylindrical recess in the back of the main slide-valve, and between the spiral openings. It is operated lengthwise by a separate eccentric, to which it is attached in the usual manner, excepting that it has a swivel-joint to permit its partial rotation. A portion of the valve-stem is made square, or sometimes arranged with a "feather," and at this place, on the valve-stem, is fitted a sector, engaging a rack on the lower portion of the governor-spindle, so that, as the governor rises or falls, the cut-off valve will partly rotate. Thus the cut-off valve is moved lengthwise by the eccentric, and, at the same time, has imparted to it, by the governor, an adjusting motion on its axis. As a consequence of the radial motion imparted by the governor, and the spiral form of the steam ports and acting ends of the cut-off valve, the distance between the openings and the ends of the valve is varied within very wide limits, the effect being to cut off the steam at any point of the stroke. The arrangement may be compared to a right and left-hand screw, formed by the shape of the valve ends and the openings. This device is extremely sensitive to the action of the governor, as the rectilinear motion by the eccentric causes the radial or axial movement of the cut-off valve to be affected by the least possible amount of force. This compound motion also highly favors the perfection and durability of the surface. In engines of a larger size, where it is desirable to have short steam passages, the main and cut-off valves are divided through the centre, and each end carried outward to act on the steam-ports of the cylinder at its ends, as is usual with the ordinary slide-valves as severally constructed.



*THE RIDER VERTICAL ENGINE.*



*THE RIDER CUT-OFF VALVE.*

The vertical engine, of which our engraving will give a good idea, is remarkably compact, neat, and efficient. At the late Fair of the American Institute, one of these engines, rated at about eight-horse power, was kept in constant operation, and from the small space occupied by it, and the economy of fuel which it exhibited, it gave very general satisfaction. Alongside this upright engine was placed a large horizontal engine, furnished with a cut-off constructed on the same general principles, and the smooth and regular action of both engines was very gratifying to all admirers of fine mechanism. We understand that these engines, after a careful test, received the first premium, and they certainly deserved it.

The importance of economy in the use of steam can hardly be overrated. Fuel is yearly becoming more expensive, and power, consequently, more costly. Hence, any device that will enable us to save but a small percentage of this expense must be invaluable. An actual saving of even one per cent. on the cost of all the fuel used in the United States, would amount to millions of dollars in the course of a year or two. In so far as very large engines are concerned, a very high degree of economy has been reached; but in engines of the size usually employed in mills and factories of moderate size, this degree of perfection has not been attained. Already, however, the engine which we have just described has been received with marked favor by our best makers, such as the Delamater Iron Works; HANDREN & RIPLEY, of the Washington Street Iron Works; the Wood & Mann Steam Engine Company of Utica; CAMPBELL, WHITTIER & Co., of Boston; M. T. SAULT & Co., of New Haven, Conn., and other well-known engineers, all of whom manufacture the RIDER engine. The only explanation that can be given for this fact lies in the inherent excellence of the engine itself.—*The Manufacturer and Builder.*

## The Planet Saturn.

WE are told by astronomers that now is the time for viewing the large rings of the planet Saturn to the best advantage. The favorable feature of the present opportunity is that their plane is now inclined so as to show the greatest opening between them, and interest in the event is heightened by the circumstance that it occurs only once in about thirty years. A telescope of moderate size will reveal the phenomenon and stimulate the gazer to hazard a guess as to the material of which the apparently luminous bands are composed of. Indeed, there is no limit to the theories which may be advanced on this subject. The number of these rings is uncertain. Viewed through ordinary telescopes, there appears to be but two, but instruments of greater power establish the fact that these are composed of several narrow ones, while within the inner luminous ring has been discovered another dark ring translucent to such a degree that the body of the planet can be seen through it. This ring lies within 8,000 miles of the planet. The breadth of the inner bright circle is 16,000 miles, and that of the outer one 10,000 miles. Their thickness is estimated not to exceed 50 or 100 miles. It is an accepted theory that these rings are sustained in the same manner as our moon is sustained in its revolution about the earth. As to their composition, the idea has been suggested that they consist of matter in a liquid condition. Another theory is that they are composed of solid matter divided into myriads of little bodies which have no cohesion, each revolving independently in its orbit, giving rise to the appearance of a bright ring when they are closely crowded together, and a very dim one when they are scattered. The latest speculations on the subject are to the effect that these rings constitute moons in process of formation from gaseous matter thrown off from the body of the planet; then when a ring becomes too heavy it loses its cohesive force, breaks and rolls up into a spherical body revolving upon its axis. This theory involves the supposition that all planets may form for themselves new moons in the same manner.

## American Mining and Metallurgy from a Foreign Standpoint.

Notes of a Tour of Observation, by Professor F. STAPFF, of Sweden, Special Correspondent of THE ENGINEERING AND MINING JOURNAL.

I.

I HAVE just completed a somewhat extensive journey, following the great metallurgical route through New Jersey, Pennsylvania, Ohio, and Missouri, and visiting the New Jersey Zinc Company's works at Newark; the Mine Hill and Sterling Hill mines at Franklin; the Anderren blast furnaces at Phillipsburg; the Lehigh Zinc Company's zinc mines in the Saucon Valley, and zinc mines at Bethlehem; the Bethlehem Iron-works; the Catasauqua, Hokendauqua and Lochridge Iron-works; the South Mountain iron mines; the Summit Hill anthracite mines; the Pennsylvania Bessemer steel-works at Harrisburgh; the Johnstown iron mines, coal mines, and iron-works. At Pittsburgh I saw the Sligo iron-works, Messrs. SCHONBERGER & BLAIR'S iron-works; Messrs. ANDERSON & WOOD'S steel-works; the Lake Superior copper and steel-works; the Monongahela copper works, and some coal mines. At Cincinnati I watched, for some hours, Mr. BANES'S puddling furnace in the Cincinnati Railroad iron-works; and in the State of Missouri, a week was spent in the examination of the Pilot Knob, Shepherd Mountain, and Iron Mountain iron mines, and of the charcoal furnaces at Pilot Knob, Iron Mountain, and Irondale. At all the establishments named, I was the recipient of most courteous treatment, and shall always recollect this trip of observation as a very instructive and pleasant one, which has, moreover, taken from me many European misconceptions, concerning not only American mining and metallurgy, but also American society and daily life. But now the fickle and unpleasant winter season makes me wish to spend the succeeding winter months in a more regular activity than riding on the highways.

As I possess no other practical experience about the metallurgy of iron than that acquired by frequent visits at the most remarkable European iron-works, and picked up in daily commerce with the most renowned Swedish iron-masters, I shall not undertake a detailed description of all the iron-works hitherto visited in America, especially as my limited time and the large extent of those establishments permitted, in many cases, but a hasty inspection. My remarks on American iron-works will be confined to a plain communication of some observed facts, which seemed to me worth notice. With regard to the mining and the metallurgy of "nobler" metals, (as they are called in Sweden), I move upon a field of thirteen years' practical experience and of five years' professorship. Consequently, these matters have attracted my attention in a higher degree than the iron business; and I hope that my observations on the economical geology and the mining operations of the localities examined, will be of some interest.

### IRON WORKS.

*Iron Ores.*—The New Jersey Zinc Company use in their furnaces at Newark the residuum from the fabrication of zinc-white out of the Franklin zinc ores. This residuum contains metallic iron and the oxides of iron, manganese, and zinc, dolomitic lime and silicates occurring in the ore bed, and the ashes of anthracite, with which the ores were reduced in the zinc furnaces. It is a kind of cinders, from which the dust is to be sieved before they are put in the blast furnaces. They make a splendid spiegel-eisen, yielding 0.17 per cent. of phosphorus and about 11 per cent. of manganese, according to an analysis which Mr. BELL courteously communicated to me. Some uncertainty about the percentage of manganese and phosphorus in this spiegel-eisen seems, however, to exist; and I am not surprised at that, considering the difficulties of an exact analytical determination of those substances in iron, etc. Indeed, I know no other *practical* methods for the determination of manganese, silicon, carbon, phosphorus, and sulphur in iron, etc., than those of Professor EGGERTZ, of Fahlun, to which methods the metallurgists of this country seem not to have given so much attention as their great practical value deserves.

Magnetic iron ores, from the Rockaway, Allen, Dover, and other New Jersey mines, are used at Anderren, Hokendauqua, Catasauqua, Lochridge, and Bethlehem. They are accompanied with felspar, chlorite, hornblende, and some of them with limestone. The Rockaway ore contains a little pyrites. The average quality of the very best Dover ore is about 50 per cent.; Rockaway, 40 to 45 per cent. But from some of these ores the rock is very incompletely separated, so that they yield only about 30 per cent., and less. This little circumstance, which could be remedied easily enough at the mines, causes a considerable waste of freight expenses, of limestone, (so far as the ores are not accompanied with limestone), and of fuel.

The magnetic ores from the Cornwall mine, (Lebanon, Pa.) used at Bethlehem, are rich, but their value could be greatly increased by a more careful separation of the pyrites and copper ores which occur in the Cornwall ore-bed. Hokendauqua, Catasauqua, and Lochridge employ magnetic ores from the South Mountain mines, (about twenty miles southwest of Catasauqua) yielding forty per cent. and accompanied with felspar, quartz, chlorite and hornblende.

Messrs. SCHONBERGER & Co., at Pittsburgh, use magnetic ores from Coburg, Canada, which are associated with limestone, pyrites, and perhaps a little apatite. The Lake Champlain magnetites, characterized by a coarse, granular crystalline fracture, are also often used at Pittsburgh, for lining puddling furnaces, and by Messrs. SCHONBERGER, in the Ellershausen process. Magnetic ores from Troy, New York, which the latter firm also make use of, are said to give a cold-short iron.

The rich magnetic ores of Shepherd Mountain, Missouri, were shipped in large quantities, before the war, to Pittsburgh and elsewhere. If I remember aright, a small amount of them is still stored in the Messrs. SCHONBERGER'S ore-yard. These ores are associated with decomposed porphyry, quartz, epidote, "green earth," and red and brown hematite in rugs.

The Iron Mountain, Missouri, magnetites are shipped in bulk to Carondelet, and to Pittsburgh and other places in Pennsylvania and Ohio. A relatively small quantity of these ores supplies the blast-furnaces of Iron Mountain and Irondale. An analysis by Mr. DORNBACH, gives iron, 68.95; oxygen, 27.00; sand and silicates, not dissolved by acids, 3.07; manganese, traces; specific gravity, 3.997. These ores yield, in the Iron Mountain furnaces, on the average, about fifty-seven per cent. They are easy to be recognized by their blueish color, on fresh fracture, and by a rusty cover on the compact lumps, which sometimes include small nodules covered with crystallized quartz, and kidneys of parti-colored decomposed porphyry. I do not know how much phosphorus these valuable ores may contain, but their percentage of sulphur must be very small; for the Iron mountain furnace-cinders develop no perceptible hydrosulphuric odor when cooled with water. If the Iron Mountain magnetites and the South Illinois stone-coals should be brought together at St. Genevieve or Kaskaskia, one might expect the development of an iron industry in the Mississippi valley, which soon would outflank that of Pittsburgh.

Red hematites from Lake Superior, characterized by a slaty structure and numerous small octahedral crystals of martite on the cleavages, are said to give a somewhat cold-short iron. Their average percentage at the SCHONBERGER furnaces is said to be about sixty-nine per cent.

Specular iron ores from Pilot Knob, Missouri, yielding, according to an analysis of Mr. DORNBACH, iron, 54.307; oxygen, 26.720; substances not dissolved in acids, 17.509, average at the Pilot Knob furnace, about fifty-two per cent. when burnt. Their fracture shows a fine crystalline grain, but thin layers of this compact oxide of iron often alternate with others of felspar—this material impregnated with the oxide of iron. This ore contains a little sulphur, and probably also phosphorus.

Carbonates of iron are the principal ores at the Johnstown iron-works. They are of greenish or blueish gray color, and possess earthy fracture. Some carbonate ore-beds at Johnstown consist of clay-slate, others of marl-slate, both impregnated with the carbonate of iron. The former give the so-called silicious, the latter the so-called calcareous, ores, which can be treated in blast-furnaces without limestone-flux. Both these varieties together render in average about thirty per cent. I cannot tell how much or little phosphorus they may contain.

Brown hematites, the outcrops of the Johnstown carbonate ore-beds, present a light brown, clayey hematite, yielding about forty-two per cent., and valued as a pure iron ore. The very best brown hematites are said to be those which, at Tyrone and Altoona, Pennsylvania, are used for the celebrated Juniata charcoal-iron, and which, at the Sligo works, Pittsburgh, also are employed in the Ellerhausen process. Washed specimens of these hematites, which I saw at Pittsburgh, were of a stalactitic form, and considered to yield about sixty per cent. But besides those stalactites, irregular lumps and bean-formed nodules of hematites, yielding thirty-three to forty-two per cent., occur in the surface-clay at many places in Pennsylvania, and are used at Anderren, Hokendauqua, Catasauqua and Lochridge. At Johnstown is used (besides the hematites spoken of) a so-called "fossil-ore," which looks like common surface-hematite, but was said to contain phosphorus. Missouri also abounds in hematite surface-ores, which are used, for instance, at Irondale, where I saw some pseudo-morphs of hematite after marcasite and pyrites. Some of these pseudo-morphs contain kernels of $Fe\,S^2$, and thus indicate almost directly the origin of these hematites.

Finally, it is to be mentioned that cinders from rolling-mills, re-heating furnaces, etc., are used in the blast furnace process at Bethlehem and at the SCHONBERGER establishment. Together with the sulphurous ores from Lebanon and Coburg, they make a pretty good iron, which at Bethlehem is used for rails, and at SCHONBERGER'S works for the fabrication of nails.

*Limestone.*—Oyster-shells, together with silurian limestone, serve as flux in the Newark furnaces. As oyster-shells yield a relatively large quantity of phosphorus, and almost all the phosphorus of the flux gets concentrated in the pig-iron, it seems rather remarkable that the Newark spiegeleisen was found to yield *more* phosphorus when produced without, than when produced with, oyster-shells. This fact—unless it is a mistake depending upon the analytical method, for the determination of phosphorus—would indicate that the silurian limestone, which is used at nearly all furnaces east of the Alleghany mountains, must contain a rather large quantity of phosphoric acid. This is likely to be the case with all limestones which enclose abundant petrifications, and possibly also the limestones of the carboniferous epoch, which are used in fluxing at the Johnstown and Pittsburg furnaces, possess the same peculiarity. The Missouri charcoal furnaces employ saccharoidal crystalline dolomitic limestone, which, however, is much contaminated with "green earth," a kind of glaukonite. It has not been examined for phosphorus, though this point seems worthy of notice, since pig, from the very best iron-ores, may be deteriorated by phosphorous fluxes.

*Fuel.*—The charcoal used at Pilot Knob, Iron Mountain, and Irondale, is burnt in piles from oak, hickory, pine, gum, sycamore, etc. Sycamore and gum make a rather soft coal-bed for the blast furnace process; but the coal from the other kinds of wood named is heavy, hard and strong. About one-tenth of the coal-charges are "brands," which do pretty well in the furnace, giving plenty of gas, but sometimes also of smoke. The distance from which charcoal has to be carried to the furnaces is often about twelve miles, and around the furnaces a second growth is springing from the brush of the primitive backwoods. If you ask how many years more charcoal furnaces can exist in Missouri, you will hear fifteen, twenty, forty years. The prices of charcoal at the Missouri furnaces are almost dependent on the distance from which the coal is transported; they are said to average five and a-half cents at some furnaces, and at others seven and a-half cents, per bushel of twenty pounds.

Anthracite was first introduced in this country as fuel for blast furnaces by Mr. THOMAS, Sr., of Catasauqua; at present all furnaces east of the Alleghanies (Newark, Anderren, Bethlehem, Hokendauqua, Loc ridge, Catasauqua, etc.) use anthracite from the Wilkesbarre, Lehigh Valley, and Schuylkill Valley seams. This anthracite is said to yield, on the average, eighty-nine per cent. of carbon; but I have seen some which was highly intermixed with shale and dirt. It seems curious enough that the Pennsylvania anthracite mines have not yet adopted the European coal-washing machines, by which a great saving of wages for picking over, and at the same time a better product, may be obtained. The anthracite from Summit Hill "Big vein" appears to be very free from pyrites, the ashes left behind being quite white. The anthracite prices at Summit Hill were: lump, $4 25; stove, $4 50; broken, $4 25; egg, $4 25; chestnut, $3 75; pea, $2 00 per ton.

Coke, from soft semi-bituminous coal, is used at Johnstown. This coal, coked in open piles, yields forty-five per cent. of good coke. Coking furnaces are now under construction, from which it is hoped to get sixty per cent. The Johnstown coals are comparatively free from shales, as might be expected, since, in mining, the bottom vein of eight inches, and the covering slate, are both left behind, and nothing is extracted but the three and a-half foot top-vein, in which also the cuts are picked. The result may be waste in the mine, but it gives, of course, pure coal for the furnace. The bituminous coal which, worked in piles or old-fashioned coking kilns, is used at the Pittsburgh furnaces, contains considerable pyrites, occurring in the coal itself in the form of small kidneys and very thin sheets. It is easy enough to wash shale from coal, or to wash sulphur from coal, when the pyrites sit in the shale; but it is practically impossible to improve the quality of coal by washing, when the coal is not only free from shale, but streaked with fine impregnations of pyrites. The Pittsburgh coal mines examined by me were also worked after a plan by which plenty of coal is wasted, but shale-free coal obtained. The Pittsburgh coal-prices varied from $2 25 to $2 75 per ton.

A special kind of bituminous coal, working without much swelling, is extracted in Ohio and Western Pennsylvania. It is used at the blast furnaces without previous coking.

*Roasting of Ores.*—The specular iron ores of Pilot Knob are roasted at the Pilot Knob charcoal furnace in piles, each containing about two thousand to three thousand tons, and burning six weeks. The bottom of such a pile is made of sticks of wood, laid about five feet apart and closely covered with other sticks put crosswise. Upon this bed are spread alternately layers of ore, about eighteen inches thick, and of coal-dust four to six inches thick. The ore is broken to small fist-size. Well roasted ore is red outside, and composed of concentric shells, which enclose a kernel. This kernel is commonly rather raw; but when well burnt it is brownish, loose as the surrounding shells, and bursts open.

Quite the same plan of ore-burning is followed at the Iron Mountain and Lochridge charcoal furnaces, which use the magnetic ores from Iron Mountain. At Iron Mountain the burning seemed to be somewhat imperfect and superficial. The Johnstown carbonates of iron are burnt in large heaps sixty to seventy feet high, leaning against the steep slope of the hill, between the coal-yard and the railroad from the ore-beds. From this railroad the ore is dumped directly down the hill, and after every ten ore-cars a car filled with coal-dust is emptied over the ore. In this way a heap of twenty thousand tons of ore and more is accumulated, to which fire is set by coal-filled flues passing into the bottom of the heap. The heap burns about three months. The roasted ore has a brownish color and a greater hardness than the crude ore. Very often a crude kind remains enclosed in a shell of well-burnt ore.

I do not remember that the ore was burnt or roasted at other furnaces than those I have enumerated, and it seemed to me very remarkable, that ores yielding more or less pyrites, as those from Lebanon, New Jersey, Coburg, etc., were put in the blast-furnace without previous roasting. At the Swedish charcoal furnaces all magnetic and specular iron ores are carefully roasted, whether they contain visible pyrites or not. The ore-roasting is there considered to be a preparatory process, necessary, not only for the removal of sulphur, but also for the saving of fuel, and the attainment of a clean furnace run. In former times the Swedish ores were burnt in heaps or piles, with charcoal dirt as fuel; at present, I do not know many iron works in Sweden (bog-ore furnaces excepted), where the ores are not roasted in kilns fired with gas from the blast-furnaces.* But it should be observed, that the blowing engines at most Swedish blast-furnaces are moved by water-power, and that, in consequence, all the furnace-gases by which in America the steam-boilers are to be fired, in Sweden are available for firing roasting-furnaces. By covering the blast-furnaces, one could perhaps catch as much gas as is wanted for firing boilers, blast-heating furnaces and roasting furnaces, altogether. American iron-masters are commonly of the opinion that a roasting process takes place in the upper part of high blast furnaces, and that therefore a previous and separate roasting of the ores may be dispensed with if the blast-furnaces are only high enough (say fifty-five to seventy feet) although a roasting of the same ores is necessary when they are reduced in blast-furnaces so small as those of Sweden and Missouri.

*Charging the Blast-Furnace.*—I was not a little surprised at the large lumps of anthracite, lime, and ore, which the great American blast-furnaces are expected to digest. With regard

* Such a Swedish gas-roasting furnace, of Mr. WESTMAN'S construction, is in use at Ringwood; it is said to do pretty well, but not to give any economic saving.

to the anthracite and lime, the clever explanation was made that these brittle substances (lime becomes brittle when burnt), would, if delivered in small pieces, be crushed, during their long progress through the stack, to fine dust, causing obstruction of the furnaces; but as to magnetic and specular iron ores, this explanation seemed not quite so satisfactory. I was glad to find at the SCHONBERGERS' furnaces, that the magnetic and specular iron ores were broken to fist-size before they were put into the furnaces; and at the Missouri charcoal furnaces ore and lime were broken completely, as in Sweden.

The most of the American coke and anthracite furnaces are charged with the same carelessness as the European ones. Coal-cars, ore-cars, and lime-cars are generally dumped at the furnace-top, with little or no reference to the place which the contents receive in the furnace. But there are some exceptions. Mr. THOMAS, at Hokendauqua, has a cone of cast-iron fixed close below the top of the furnace; upon the surface of this cone the charges were spread, and thus guided to the interior walls of the furnace. At the Missouri blast-furnaces a charging-funnel is in use, which very much resembles those used in Austria, and in later times tried in Sweden.

TO BE CONTINUED.

## The United States Mining Law.

CONCLUDING LETTER FROM HON. E. F. DUNNE.

R. W. RAYMOND, ESQ., U. S. COMMISSIONER, ETC.:

DEAR SIR—In my second letter, I completed the discussion of the first four objections to the present law; and, following the order I have laid down, I proceed with the remaining topics suggested, and shall furnish in the present communication what I have to say upon this subject. [NOTE.—The admirable spirit of Judge DUNNE'S articles, and the important nature and great good sense and ingenuity of his suggestions, have decided the Commissioner to publish these letters in full, over the name of the author, in his forthcoming Official Report.—R. W. R.]

FIFTH.

*Objection.*—That there is no provision made for bodies of outlying ore, almost always found near a productive vein, but which, strictly speaking, are not a part of it.

*Amendment.*—SECTION —. The owner of any vein included in a patented area, which has been followed into a tract adjoining, shall be entitled to all the mineral within twenty feet of the walls of said vein. Where two veins approach each other nearer than forty feet, the elder location shall be entitled to all the mineral contained within a space of twenty feet from the walls of its vein, and the mineral contained within the remainder of the intervening space shall belong to the other location.

SIXTH.

*Objection.*—Not providing, where two veins cross in depth, who shall have the ore throughout the space of intersection common to both veins.

*Amendment.*—SEC. —. Where two veins cross in depth, the elder location shall have all the mineral contained within the space of intersection, but no right to twenty feet, or any other amount, beyond said space.

SEC. —. Said space of intersection shall be determined as follows: Connect the four lines formed by the intersection of the walls of the two veins with one another by planes enclosing a certain space, limited on the four sides by the said planes, and extending in depth as far as the intersection extends.

SEC. —. The younger location shall have such right of way through said space of intersection as may be necessary for the convenient working of its mine.

SEC. —. In case of dispute as to these lines, or this right of way, the local, State, or Territorial courts may determine the same, under such regulations as the respective States or Territories may prescribe.

*Note to title Sixth.*—I have endeavored to define the boundaries of the space of intersection in accordance with the memorandum you furnished me.

SEVENTH.

*Objection.*—Not determining, in cases where two veins unite in depth, who shall take the vein below the point of union.

*Amendment.*—SEC. —. Where two veins unite in depth, the elder location shall take the vein below the point of union, including all the space of intersection. Said space of intersection to be determined, as far as may be, as hereinbefore provided where veins cross in depth.

EIGHTH.

*Objection.*—Granting patents before work enough is done to determine the width and course of the vein.

*Amendment.*—SEC. —. No patent shall issue until one thousand dollars has been expended in working the area claimed, and work enough done to permit of the width and course of the vein being determined to the satisfaction of the officer making the survey.

*Note.*—I have drawn this section to meet the objection as made, but I do not concur in the objection. What does the Government care whether there is a mine in the area or not, so long as the claimant is willing to buy the land and pay more for it than could be realized by any other sale? What does the Government care whether the land will yield a bullion crop or not? That is the buyer's business. When a man asks for a patent for agricultural land, the Government never requires proof that the soil will raise any particular crop. It sells its land for a certain price, and looks no farther. I have heard but two reasons for the objection under consideration. First, that unless something of the kind is done, the Government might sometimes be aiding in putting a swindle upon the market, by dignifying the location with the grant of a patent. But the day of blind and reckless purchase of mines has passed. Mines are bought now like other property, after examination. If the proposed vender cannot show mineral, the fact of having a patent will not help his sale. The other objection is, that the pursuance of a too liberal policy would throw many mines into the hands of mere speculators, who would hold them tied up until they could get their price, and that the bullion product would be affected thereby. There is some force in this objection. It is indisputable that quite a number of mines would be so tied up and their development retarded; but in my opinion this evil would be greatly overbalanced by the greater number of mines that a more liberal policy of granting patents would bring into market. People are not inclined to hold on to an unprospected mine of unascertained value when any reasonable offer is made by capital to take hold of it, and get the bullion out of it. Rich men will not keep such a mine back, because, if the show is good, they will work it themselves. Poor men will not hold on long, because they cannot afford it. But it may be said we require the performance of certain conditions with regard to agricultural lands sometimes, such as residence and a certain amount of improvements as evidence of good faith, and that this one thousand dollar requisite is for the same purpose. But the good faith required is not the same in each case. We want the settler to convince us that he intends to live upon the land, and so we require him to go there, put up a house and reside in it, so as to show that he really intends to perform the very thing we want him to do. Now, what is it we want the prospector to do? Simply this, to go out and hunt for mines, to get his titles in good shape, and then take them to money centres, and get capital to develop his claims. If he thinks it is necessary to make a good showing on his location, that he should expend one, two or three thousand dollars' worth of work upon it, he will do it, if possible. If he has found a mine where it is not necessary, why compel him to do it? What good is done to any body by requiring him to expend money when he is unable or unwilling to do so? The requirement does not compel him to abandon his claim, and let some one with more money come in and take it, for he can still keep up his title under district laws for a nominal sum. It merely prevents him from obtaining a patent by means of which, on account of the greater security of title it affords, he might get money to develop his claim. It also delays indefinitely the closing up of this part of the business of the Land office, by necessitating the doling out of patents at a rate that would keep the office running for a thousand years, consuming the whole of the receipts from sales of this class of land in the mere routine of giving title. Why not adopt a free and vigorous policy, which would cause our vast mineral region to be quickly explored, thoroughly surveyed, carefully mapped, and voluminously reported upon by the thousand different experts that would be called upon to examine the various claims, thus in the quickest practicable time, and with the least possible expense to the Government, shedding a flood of light over this vast and important region of our country, now so little known even to ourselves, to say nothing of the world at large. What if a few wrong-headed, obstinate men, here and there, attached undue importance to their claims, and kept them out of market for awhile, would not that evil be overbalanced a hundred times by the great impetus to investment such a policy would give?

NINTH.

*Objection.*—That the law does not provide for a uniform condition of tenure of possessory claims.

*Amendment.*—SEC. —. Possessory claims to mineral lands may be held from year to year, only by complying with the following conditions:

SEC. —. The owner or owners of any mining location existing on the first Monday of July, 1870, shall, within sixty days thereafter, under penalty of forfeiting said claims, file with the Recorder of the district in which such claim is situated, and within like time cause to be recorded in his records, a description of the claim, which shall state:

1st. The name of the claim.

2d. The date of the location.

3d. The number of feet claimed, and in what direction from the initial point on said claim.

4th. The names of the original locators, when they can be ascertained from the records of the district.

5th. A description of the place of location of the claim, together with the initial point of the claim, by reference to surrounding objects, which reference shall be sufficiently exact to enable a person of ordinary intelligence to find the premises from such description.

SEC. —. No location made on or after the first Monday of July, 1870, shall be valid, unless a description of said location, as above set forth, be filed and recorded, as above, within ten days after the date of said location.

SEC. —. The year of tenure shall, in all cases, be computed from the first Monday of July nearest to the date of location, and shall extend from and including said first Monday of July, up to and including the day immediately preceding the next following first Monday of July.

SEC. —. For the purpose of determining conditions of tenure, the term "possessory claim" shall be held to mean the whole area claimed for which a patent may issue, whether the same be held by one or more persons.

SEC. —. On every possessory claim of mineral land sought to be held from year to year, there shall be done for and during each tenure year, and upon the area claimed, an amount of work equal to twenty days' faithful labor of one man, or there shall be annually paid, instead of said work, the sum of one hundred dollars as license dues.

SEC. —. All moneys paid as license dues shall be paid to the United States Internal Revenue Collector, or his deputy, for the district in which the mine is situated, and his receipt therefor shall be recorded in the records of the district, if such exist, and also in the public office of the person whose duty it is to keep the records of deeds of the county in which the mine is situated.

SEC. —. When work is done, instead of money paid, the Recorder of the district, or his deputy, or if neither can act, or if they fail or decline to act, then the person whose duty it is to keep the record of deeds of the county, or his deputy, may measure and certify said work; and such certificate shall be recorded in the records of the district in which the mine is situated, if such records exist, and also in the public office of the person whose duty it is to keep the records of the deeds of the county in which the mine is situated.

SEC. —. All the said conditions must be complied with within ninety days after the date of posting the notice of location for new locations, and before the first Monday of October of each year for all other locations.

SEC. —. The performance of the said labor, or the payment of the said fees instead thereof, shall be the essential requisites for maintaining title, but the absence of the recordation prescribed shall be *prima facie* evidence of non-compliance with the essential requisites, and a re-location made in the absence of such recordation shall be good until proof of the performance of the essential requisites is made, and that reasonable diligence was made to obtain said recordation; and also until the re-locator is reimbursed for his reasonable expenses in making such re-location.

SEC. —. A non-compliance with the essential requisites above described, shall work a forfeiture of the claim, and a claim so forfeited may be re-located with no other formalities than those required for an original location.

SEC. —. When any act, which by this Act is required to be performed within a certain time, is not done within such time, but is subsequently performed in the interest of the party originally failing, and before any other person has taken advantage of such failure, such subsequent performance shall have the same force and effect as a performance thereof within the time prescribed.

TENTH.

*Objection.*—That there is no provision for the safe-keeping of district records.

*Amendment.*—SEC. —. District laws shall in all cases be recorded in the public office of the person whose duty it is to keep the records of the deeds of the county in which the greater portion of the district is situated.

SEC. —. Laws existing on the first Monday of July, 1870, shall be void, unless so recorded before the first Monday of October, 1870.

SEC. —. Codes for new districts shall not be valid, and no rights shall accrue under them, unless recorded in the public office of such custodian of deeds within ninety days after their adoption.

SEC. —. No amendment to any code, and no new code supplanting an old one made after the first Monday of July, 1870, shall take effect until thirty days after such amendment or such substituted code has been filed for record in the public office of such custodian of deeds, and a notice of such filing published in some newspaper (if any there be) published in the county in which the greater portion of the district affected thereby is situated.

ELEVENTH.

*Objection.*—That a distinction should be made between veins and simple deposits, and that the latter should be bounded by the area granted, and by vertical planes in depth.

*Amendment.*—SEC. —. All notices of application for patents shall state whether the claim is for a vein or a deposit, or both.

Protests may be filed against each claim by any person affected thereby, the same as by this act may be filed in cases of disputed title, and shall be disposed of in like manner with such protests.

SEC. —. When a patent issues for a deposit claim, the rights of the patentee shall be confined to the space granted, the area of which shall not exceed five hundred feet square, except in the case of patents for placer mines, river diggings, grant claims, and cement deposits, provided, however, that the same principles of consolidation in obtaining patents in this act accorded to new locations, shall also extend to deposit claims.

NOTE.—I have drawn this section as to deposit claims because many are urging the need of such a provision, but I do not see the necessity of it. Every claimant is restricted to the space granted until he claims the right to go beyond it by reason of having a vein which extends beyond his boundaries and which he wishes to follow. It seems that that is the time to determine whether his claim as to the existence of a vein is well founded. There are workings then which will aid in the determination of the question. The course of the deposit is then bared to view, and until that is done no satisfactory determination can be had.

TWELFTH.

*Objection.*—That the law does not extend to placer claims, river diggings, etc.

*Amendment.*—SEC. —. The provisions of this act as to the insurance of patents for deposit claims shall apply to gold-mining claims of the kind generally known as placer mines, river diggings, grant claims and cement deposits.

SEC. —. The rights of the patentee in such case shall be confined to the space granted, which may be of such form and extent of area as is allowed by the laws of the mining district in which said claim is situated, provided that the area of any such claim shall not exceed in extent an area equal to three thousand feet square.

THIRTEENTH.

*Objection.*—That the act does not provide a fund to assist in making surveys, and in founding a mining school.

*Amendment.*—Levy a bullion tax of one-eighth of one per cent. to be paid quarterly to the United States Collector of the mineral land district in which the reduction works where the bullion is produced are situated.

SEC. —. All moneys paid to any Collector of the United States for license fees and bullion tax shall be apportioned by

him as follows: First, he may retain three per cent. of the same to his own use, which shall be his compensation for managing said fund. Second, he shall set aside fifty per cent. of the remainder for the benefit of the mining school fund of the State or Territory from whence said license fees were received, or which furnished the one from which the bullion was obtained which paid said bullion tax, and as soon as said State or Territory shall have authorized its Treasurer to receive said moneys for said purpose, he shall pay the same to said Treasurer quarterly, and thereafter said funds may be appropriated by said State or Territory for the establishment and maintenance of a mining school, either as an independent institution, or as an adjunct to any State or Territorial educational institution already established, under such regulations as said State or Territory may prescribe. Third, The remaining fifty per cent. of said remainder of said fund he shall pay quarterly to the Treasurer of the United States, who shall place said moneys in a fund to be known as the National Mining School fund, and retain the same subject to the order of the Congress of the United States.

SEC. —. From time to time, sums which, with those already appropriated, do not exceed in total aggregate fifty per cent. of the total receipts of said fund, may be appropriated from said National Mining School fund to aid in making surveys of mineral lands.

*Note.*—For many years the revenue from the bullion tax will be much less than that from license fees. The producing mines should not object to the bullion tax because an amount in excess of what they pay will be devoted to mining schools which producing mines are interested in sustaining in order to have a large corps of experts to choose from to conduct their works. The poor miners will not object to the license tax, because they will get the benefit of the surveying fund without materially increasing the tax they now pay, from which they derive no benefit.

FOURTEENTH.

*Objection.*—Not preventing parties from floating a location originally placed upon a worthless claim to some other claim of greater value subsequently discovered.

*Remark.*—This is covered by the first section under title nine of these suggestions.

FIFTEENTH.

*Objection.*—Allowing the Register to publish the notice required for a patent at such cost to the claimant as the Register and printer may choose to agree upon, instead of permitting the claimant to make his own bargain for such service.

*Amendment.*—In Section 3 of the act, change the words: "The Register of the Land Office shall publish a notice of the same, etc.," so as to read "The Register, etc., shall require satisfactory proof of the due publication of the same, etc."

SIXTEENTH.

*Objection.*—That the law does not prohibit the location of mere extensions, where no ore has been discovered.

*Comments.*—I do not concur in this objection for the reason set out in remarks under title eight, but I submit the following amendment, as one that would cover the case if the objection is admitted:

SEC. —. No location shall be made until quartz or other rock in place-bearing gold, silver, cinnabar, or copper, has been discovered within the area claimed. The party making such discovery shall, for the period of thirty days immediately thereafter, have the exclusive right to locate the same.

CONCLUSION.

I have now gone through with all the recommendations in your report, and embodied them in the form of amendments, together with some suggestions which have been generally sanctioned in the regions where I have resided. I have found every step beset with difficulties. I suppose there is not a single amendment here proposed to which some one will not take some exception. Nothing will please me more than to have some one in such case propose other amendments which will give better satisfaction. If all persons interested will give the subject careful consideration, and forward their suggestion to you, much light may be thrown on the matter, and the Congressional Committees on Mines and Mining will have abundant data to work upon.

I remain, respectfully, your obedient servant,

E. F. DUNNE.

## Some Occurrences of Native Copper at Keweenaw Point, Lake Superior.

Translated from the German of Professor HERMANN CREDNER, of the University of Leipsic, by MAX MOELLER, M. E.

III.—THE CLIFF VEIN.

THE Cliff mine is situated in the southeast slope of the northern of the two ridges forming the melaphyr zone; that is, in the longitudinal valley between them. The mineral deposit is a vein, traversing the stratified igneous rocks at right angles with their strike. The walls of this vein present the following section of the country rock, beginning below.

*(a.)* Melaphyr, dark or reddish brown color predominating, sometimes, however, ash-green, partly amygdaloidal. In the latter case, the round or oval centres occur in a dense, or earthy, or fine-grained matrix, and are filled with white calcspar or reddish laumonite, radial apple-green prehnite, solid or radiated epidote, and dark-green iron chlorite. Sometimes the cavities are but partly filled, being lined with small sharp crystals of epidote, and frequently the grains of laumonite and calcspar are clothed in a thin scale of the chlorite. Copper occurs only now and then in paying quantity, in grains and scales, or massive, in the filling of the amygdaloid cavities, and finally jagged forms in the matrix.

These melaphyrs and amygdaloids form the southeastern base of the already mentioned northern cliff, several hundred feet high. They have a thick bedded character, and dip northwest at an angle of 30°. The partings between every two beds consist of seams of calcspar, hardly one-twelfth of an inch thick. A distinct upper boundary is given to these melaphyrs by—

*(b.)* A layer, ten to fifteen feet thick, of a soft, shaly, chlorite rock, with the same strike and dip as the melaphyr-beds. This is covered by—

*(c.)* Dioryte of course texture, consisting of predominant black-green hornblende, in short prisms or radiating needles, and light olive-green grains of oligoclase, with distinct twin-striation. Exposed to the atmosphere, it weathers to dirty yellowish-white, and only in this condition does it clearly show the alternating proportions of the hornblende and felspar. Layers of radial and columnar hornblende, of black color, alternate sharply with zones poor in hornblende, but rich in felspar, and present a parallelism so complete, that the rock appears, from a distance, to be actually stratified. This alternation of different varieties of dioryte corresponds with a terrace-like arrangement of the whole dioryte formation of the locality, and this again is parallel with the bedding of the melaphyrs, and the slate cleavage of the chloritic masses. The dioryte forms the upper half of the southeastern slope, and the whole of its crest.

The above described series of melaphyrs, amygdaloids, chloritic rocks, and diorytes are traversed, as already mentioned, by a vein at right angles with their course. In the dioryte forming the cap of the ridge, this vein is very narrow, and nearly barren; but it widens in the melaphyr as a general thing, and becomes rich in coarse copper. Its average thickness is one foot, but it widens in some places to thirty feet, and contracts in others to a mere thread, or splinters into many branches. It is filled with—

1.—Calcspar as chief constituent. This is generally white, seldom reddish, and always of coarse structure; the cleavage in the small veins (one to three inches thick) runs from one wall to the other. In druses it is frequently transparent as water, and shows many combinations of crystalline forms.

2.—Laumonite, rose-red, sometimes flesh-red, and frequently forming in small veins the middle zone, while calcspar occurs on either side, towards the country rock. In other parts of the vein, however, the relative positions of calcspar and laumonite are reversed. Copper occurs frequently, growing through the laumonite.

3.—Prehnite, associated with calcspar, quartz, and copper. It is white, sometimes apple-green, and occurs in drusy, botryoidal, spherical, and mammillary forms.

4.—Apophyllite, transparent, white, or apple-green, forming thin tabular crystals upon calcspar, and sometimes lining the vugs. Small scales of copper are here and there enclosed in the crystals.

5.—Natrolite, in hemispheres of eccentric radial structure.

6.—Stilbite in tabular crystals.

7.—Fluorspar, in small octahedrons; found sometimes in druses upon calcspar, quartz, prehnite, and copper.

8.—Epidote, green, solid, or earthy; in alternate bands with calcspar, and sometimes coating the large masses of copper.

9.—Quartz, white, often in columnar forms, and also in druses of transparent copper.

10.—The copper is mostly associated with calcspar, and frequently occurs inside calcspar crystals, in scales or dendritic forms. On the other hand, it also frequently occurs in masses of from five to fifty tons; and in such cases the vein may be filled by a large plate of copper alone. The extraction of these masses is the main object of the mine owners. The metal occurs, however, most commonly in lumps and sheets, from four to twelve inches in thickness, and intimately associated with calcspar, epidote, and prehnite. When it occurs in druses it frequently forms well-defined crystals, such as the cube, octahedron, tetrahexadron, hexoctahedron, and combinations of these monometric forms. Twins united on the octahedral plane are especially common.

Silver occurs aggregated with the copper, and also in thin coverings, sometimes in masses of one pound.

To sum up this description, the cliff mineral deposit is a vein averaging one foot in thickness, traversing the bedded diorytes and melaphyrs, and carrying principally calcspar, quartz, prehnite, and copper. It has been exposed to a depth of nine hundred feet below the valley, without showing any alteration in character.

THE CONCORD MINERAL DEPOSIT.

The most easterly, and since the dip is to the west, the lowest copper deposit of the melaphyr zone, near the Portage Lake, is that in which are situated the Huron, Isle Royale, Grand Portage, and Sheldon-Columbia mines, south of that lake; whilst its northern continuation is exposed by the Concord mine. The latest workings in this mine give a distinct picture of the local cupriferous formation. Here, as in all the localities described in these articles, the melaphyr is heavily bedded. Its terraces or layers have a general stroke southwest and northwest, and dips 55° northwest. One of these irregular beds is the copper-deposit, and consists partly of a chocolate brown, from earthy to almost solid melaphyr, filled with threads and amygdules of pistacite quartz, laumonite calcspar, and especially green epidote mixed with quartz. For the most part, however, this last mixture supersedes the melaphyr-matrix altogether, and forms then a bed of epidote-rock containing many threads and amygdules of quartz, calcspar, and particularly of mico-crystalline pistacite. In this melaphyr-amygdaloid, and especially in the epidote-rock, occurs the copper, forming scales and grains; very thin sheets, attaining a square foot and over in size; threads branching off in all directions; and, finally, masses weighing several hundred-weight. Being aggregated with quartz-crystals, it frequently contains very sharp impressions of the latter; in druses, it is itself crystallized. Silver occurs, either associated with the copper, or insulated in the epidote-rock, as grains attaining the size of a walnut. This deposit varies in thickness from one to twenty, and even thirty feet, and is in some parts distinctly separated from the melaphyr-walls by cleavage-fissures, though in many places there is only a gradual transition to be observed. The mineral deposit of the Concord mine is therefore a cupriferous stratum of epidote-rock, or highly epidotic amygdaloid, contained in, and conformable to the bedded melaphyr.

All other copper deposits known to exist on the Keweenaw peninsula, resemble one or the other of those described in this and the foregoing articles, and may be ranked under the general classification given at the commencement of this account.

## Wooden Railways.

TO THE EDITOR—Sir: Should wood, as a material for rails, be used on railroads, either to supersede the iron and steel rails, or as an adjunct or auxiliary for special cases, it is certain that the sort of wood which possessed to the greatest extent the qualities fitting it for the purpose in view would be the sort most commanding in its claims for general adoption.

I quote from the ENGINEERING AND MINING JOURNAL of the 4th inst.:—"The rails may be made of beech or other hard English timber." . . . . . .

Very good. The Locust *(Robina acacia)*, though not an English timber, is yet as hard and heavy as any English timber, and more durable than any I know of. Its growth is so rapid, its propagation so easy, that I am of opinion that were a line of Locust rails well laid down, and simultaneously therewith the margin of such road were planted with locust trees, on appropriate soil, the plants would attain to a size sufficient for use in replacing the first laid rails when worn out, and that such plantation would keep up a supply of rails and sleepers and ties in perpetuity. This is my opinion, founded on the unimpeachable authority of "Cobbett," and long observation as to quick growth, strength, and durability.

The rest we will leave in the hands of those accomplished engineers whose province it is to decide the other points requisite, as to whether it would "crush," at a less or greater weight, the power of "bite," and the like.

PORT CHESTER, Jan'y 10, 1870. GEO. WOODWARD.

## Mining Under the Sea.

THERE is a vast copper mine in England, where shafts extend many hundred yards under the sea. The moaning of the waves as they dash against the rocks is forever sounding in those gloomy aisles. When the storms come, the sound of the waters becomes so terrific that even the boldest miners cannot stay below, but leave their work and come out upon the earth. Overhead are masses of bright copper streaming through the gallery in all directions, traversed by a network of thin red veins of iron, and over all the salt water drips, drips down from tiny crevices in the rock. Immense wealth of metal is contained in these roofs, but no miner dares give it another stroke with his pick-axe. Already there has been one day's work too much upon it, as a huge wedge of wood driven into the rock bears witness. The wedge is all that keeps back the sea from bursting in upon them. Yet there are three tiers of galleries where men work day by day, not knowing but at some fatal hour the flood may be upon them, rendering all escape as hopeless as it was in the days of Noah. The awe-stricken visitor hurries away from the scene with a heart appalled in view of the hourly dangers.

# MINING SUMMARY.

## Nevada.

MINING ON THE COMSTOCK.

Notwithstanding the fact that Comstock mining stocks at San Francisco are in a depressed state, the residents at the mines are hopeful for the future, and judging from the recent favorable developments, with good reason. The Virginia City *Enterprise*, Jan. 1, in reviewing affairs underground for the week ending that date, says: "Recent developments in the lowest levels of several of our leading mines prove that the vein carries rich deposits of ore to a great depth—a depth beyond conjecture. It is true that some of our leading mining companies, as the Ophir, Chollar-Potosi and Gould & Curry, are doing a good deal of work at present, which is costing money without bringing in money; but it is work that must be done in order to properly open the mines.

"HALE AND NORCROSS.—The Hale & Norcross Company are now taking out from their lower works about two hundred tons per day of exceedingly rich ore. This ore comes principally from the sixth level, north of the engine shaft, to which portion of the level operations are at present confined. This level (the sixth) is now connected with the fifth by two winzes, by means of which thorough ventilation is secured, and the miners work in comfort, the level being cool and pleasant. From their old or upper works they are hoisting some thirty tons of ore per day. They are now engaged in running a drift east from the 535-foot level to connect with the works of the new mine, in order to secure a more thorough ventilation, and to reach bodies of good ore left behind when that part of the mine was first worked. The machinery of the works is in excellent order, and everything is going on smoothly.

"SAVAGE.—The Savage Company are engaged in putting in their eighth station, preparatory to opening a new level; they are also drifting south from their seventh level, and are now within sixty-five feet of the north line of the Hale & Norcross, with the works of which Company they will shortly connect on their fourth level. From this drift, at a point one hundred feet north of their southern boundary, they are running an east drift. Their principal ore supply is being taken from the new body on the seventh level. For some time past work has been most vigorously prosecuted in the mine, and the outgoing foreman, Jeff. McClellan, has at least the satisfaction of knowing that he did his duty and labored manfully for the good of the Company, while Charles Bonner, the incoming foreman, will find the mine in good shape throughout.

"OPHIR.—Still battling with water. The late earthquake shock shook up the rocky foundation of the hills to such an extent that new fountains or pockets of water were tapped and the shaft was again nearly filled. They have two large iron hoisting tanks and their pump constantly in operation, and are about holding their own at

the new works, while at the old works the water is being lowered. They are engaged in building a new iron tank much larger than the largest now in use, which will be worked by the large hoisting engine. Water is hoisted very rapidly with these tanks. In the bottom of each is a valve about one foot in diameter, and they fill almost as soon as they are let down.

"CHOLLAR-POTOSI.—The Chollar-Potosi Company are engaged in re-timbering their engine shaft, which work is now pretty nearly completed. The timbers in the incline have been found in good order. Their renovated machinery works as well as new. There are two engines that were in the fire at the time the works burned down that have not yet been overhauled. They are not very badly damaged. From the old works they are now taking out about 135 tons of ore per day. This ore comes from the Blue Wing station. The new station and Blue Wing are now all in one.

"VIRGINIA CONSOLIDATED.—The main shaft is now down 500 feet at which point a station will be made for the purpose of drifting for the lead. The last set of timbers necessary to complete the shaft to the depth mentioned was put in yesterday. A sump or well to catch the water flowing in will be dug some twenty-five feet deeper than the bottom of the shaft. The rock is again hard, and since the late earthquaky times there has been a considerable increase in the amount of water coming in, making it necessary to bail occasionally, whereas before the water all came up with the dirt.

"THE TWIN.—This rich little mine at the north end of Silver City is yielding about eighteen to twenty tons of ore per day, which pays from $15 to $100 per ton. In their front lead (as yet but little prospected) they have any quantity of ore that will go from $8 to $12 per ton. They are building a mill on the canyon, a short distance below their mine, to which they will run their ore in cars as it is hoisted. When the mill is completed they will put everything through the batteries that will pay $5 per ton. As they work for gold only, no pans will be used.

"IMPERIAL EMPIRE.—Of this mine the *News* of last evening says: The little streak of good pay ore found in drifting north toward the Alpha is about a foot wide, and yields quite a quantity of ore. They attempted to work upward on it by means of a 'raise,' but were prevented by the extreme heat. The Alpha, Imperial and Empire Companies are now working together in effecting a winze communication between that lower drift and the bottom of the old Alpha incline. This will give excellent and much needed ventilation throughout those lower levels.

"YELLOW JACKET.—The 'situation' in this mine is about the same as last week. From the south shaft about 180 tons per day of excellent ore are being raised, while of low grade ore, principally from the north shaft, about 100 tons per day are being taken out. The low grade ores are shipped by railroad to the river, where they can be profitably reduced.

"GOULD & CURRY.—Nothing new as yet. They are still drifting north and south on their lower level, in soft vein matter. Owing to the swelling of the ground they have been having a good deal of trouble with the timbers in these drifts, much easing up being required. About the usual amount of ore is being taken from the upper works.

"OCCIDENTAL.—The lower tunnel is still being pushed forward along the ledge in a soft streak of ground, and no cross-cut will be made until it has reached a point immediately under the bodies of paying ore now being worked above. The usual quantity and quality of ore is being extracted from the upper level for milling. There is any quantity of ore in sight above, and it pays very evenly.

"SACRAMENTO.—From the Sacramento mine, Peytona Company, a large amount of good milling ore is being extracted. The ore is being reduced at the Summit mill, in the northern part of the city. We are informed that they now have enough ore in their dump to keep the mill running till June or July.

"BELCHER.—Present yield from thirty-five to forty tons of ore per day, car samples of which average from $30 to $90 per ton. This yield is from the upper levels, where there is good ore enough in sight to last for a year at least. Prospecting at the lower levels is temporarily suspended.

"CROWN POINT.—As yet the drifts are all either in black and grey porphyry or barren quartz. Nothing encouraging, except that a side drift north from the long east drift on the 1,000-foot level cuts into some 'lively' looking quartz.

"CALEDONIA.—This mine is looking well, and is yielding from twenty to twenty-five tons of good milling ore per day, when work is done exclusively on the pay streak. A lot of the ore will shortly be shipped for milling.

"SUTRO TUNNEL.—The Sutro tunnel was 445 feet last evening. During the week they made 45 feet, averaging 7½ feet each 24 hours. The ground is becoming more solid and compact.

"OVERMAN.—Yielding about 75 tons of ore per day, but this quantity will be nearly or quite doubled, as the main west body of ore has been cut by a drift at the 226-foot level.

"KENTUCK.—Is looking well, and yielding about as usual, with much good ore in sight."

BATTLE MOUNTAIN DISTRICT.

A letter in the *Humboldt Register*, dated Galena, Dec. 28, says that the mining interests of the district are becoming more favorable and encouraging every day. "I understand that Mr. Hogan, of Virginia City, is about to effect a lease of the Shiloh mine, and that he contemplates putting on a large force of miners to work upon it immediately. Work on the Avalanche has been suspended for a few days, owing to the illness of Mr. James Dunn, Superintendent. They have a large quantity of ore sacked and ready for shipment. The air shaft of Buena Vista is near completion, and the large ore house is ready for the reception of ore. The Butte owners expect to tap their ledge a few days. Cotton is shipping a large lot of copper ore from his mine in Copper Canyon. The B. M. M. Co. (English) have just made a shipment of a large amount of rich copper ore, and their mines are looking better every day. I learn that a change in the administration of this mine will take place about the first of the incoming year. Mr. Rafford, the present Superintendent, designs making a trip to England, and his place will be filled by a gentleman just from Cornwall, England.

Among the recently discovered ledges of prominence is the Fair View, owned by Cotton, Thorp & Co., which gives evidence of soon becoming a valuable mine. The New Jersey is another recent discovery, owned by Denton and others, and although but a few days' work have been done on it, the prospect is most flattering and the lucky owners are sanguine of a fortune."

RICH STRIKE IN THE CUMBERLAND.

A week ago, says the *Register*, Jan. 1, the workmen employed in running a tunnel to the Cumberland ledge, Gold Run district, struck a vein of ore of surpassing richness. Since its discovery a drift fifteen feet in length has been run on the vein, which continues uniformly rich and increases in thickness. The vein is about three hundred feet wide, and contains two and one-half feet of ore that will yield $300 to the ton by mill process. The owners, Charles Hassen and T. V. Julien are among the first locators of the district.

Says the same paper; "We had the pleasure of meeting Thomas Thompson, of Battle Mountain, on Thursday last, on his return from San Francisco, where he has been negotiating for the sale of ore from Butte mine. He informed us that a sample lot of the ore taken below by him, containing five and one quarter tons, sold for $802.52 or a fraction over $152 per ton, which is seventy-five per cent. of the assayed value of the ore. This from a ledge which averages three feet of ore of the quality of the sample, renders the property valuble and places the Butte among the dividend paying mines of the country."

## Tennessee and Georgia.

THEIR COAL AND IRON INTERESTS—PROCEEDINGS OF THE ATLANTA CONFERENCE.

The convention recently held at Atlanta, Georgia, for the purpose of considering and discussing the traffic in coal, and to suggest a mode of cheaper transportation in that district promises to accomplish in the end, good results. The importance of transportation was fully brought out in that body. With sixty cars equitably proportioned between the different railroads, a constant supply of good and cheap coal, it was thought, could be had at all the various cities and towns along the railway lines. With iron furnaces and foundries in North Georgia, and cotton factories in Middle and South Georgia, that noble Commonwealth will undoubtedly more rapidly recuperate her wasted fortunes.

The following is the report of Col. Hulbert, Chairman of the Committee on Railroad Transportation, submitted to the Convention: "Fully comprehending the great importance of developing our Southern coal fields, and that it can only be accomplished by and with the assistance of the railway companies in furnishing prompt and ample transportation at low rates, we respectfully recommend that the present rate of one and one-quarter of one cent. per ton per mile be maintained and that the number of coal cars be increased to 300, equitably proportioned among the roads interested. Assuming without argument, that the great importance of coal for manufacturing purposes and domestic use, and the prospective magnitude of the business werecommend the adoption of the following resolutions:

"*Resolved*, That in the opinion of this Convention, it is both the interest and duty of the railways, to use all legitimate means at their command to develop the coal fields of the South.

"*Resolved*, That the stock of coal cars should be increased to 300 as early as practicable, apportioned as follows: East Tennessee and Georgia R. R., 100 cars; Western and Atlantic Railroad, 115 cars; Georgia Railroad, 26 cars; Atlanta and West Point Railroad, 10 cars; Montgomery and West Point Railroad, 25 cars."

The report was adopted.

Col. Colyar, Chairman of the Committee on Present and Prospective Demand, submitted the following:

"The Tennessee mines and those in North Georgia, now being worked, are shipping from 490 to 500 tons daily. About three-fifths of which is sold in East Tennessee—the remaining two-fifths is shipped to points south of Chattanooga, and passes over the Western and Atlantic Railroad. This coal is produced by about six different companies, or parties, who are working upon a capital of about $1 500,000. The capital has principally been invested and the mines opened since the war, and the quantity of coal shipped has increased more than 500 per cent. in four years. The rapidly increasing demand for coal, and the utter inability of the companies to supply it has made the business exceedingly vexatious, and yet not profitable. The capacity of the Tennessee and North Georgia mines, opened and in working order, is about four times greater than their actual product—that is about 1,000 tons per day. From a careful estimate of the actual demands upon the different companies, in the shape of orders, it is certain that 1,000 tons could now be sold. The committee are fully satisfied that there is an existing and actual demand for twice the amount of coal shipped—that is a demand for about 1,000 tons per day, and that this demand would continue through six months in the year. The demand at points south of Chatanooga is less than one-half the whole amount, say from 300 to 400 tons per day, while the actual shipments to points south of Chatanooga, do not exceed 125 tons.

"The difference between the actual shipments and the demand, 500 tons per day, and the failure to supply the demand is alone attributable to the want of transportation for this coal demanded and not shipped, at an average of eight cents per bushel, the income would be $150,000. The committee beg leave to report there is a contingent demand for coal, not taken into the above estimate, which would cease to be contingent and become certain as soon as the supply was assured, which would swell the demand greatly beyond the above figure. This contingent demand comes from that innumerable class of persons who inhabit all the cities and towns of Georgia and Tennessee along the lines of railway, who have put in grates, or seen their neighbors do it, to be taken out on the first cold spell when the promised coal did not come. And it embraces another class not so numerous, but whose demands are more weighty so far as the commerce and public weal are concerned, to-wit: Those who have suspended, or more wisely failed to commence manufacturing operations for the want of a uniform and certain supply of cheap coal.

"The Committee would further report that the coal fields of Tennessee, and immediately on the different lines of railway, are inexhaustible. They have now been thoroughly opened, and the quality of the coal fully tested for all purposes, so that the quantity and quality are no longer matters of doubt or speculation. The coal is well adapted to all the uses to which the ingenuity of man has applied it, either in England or America, and judging by the light of the past, as well in the old world as the new, those immense coal fields now being developed will soon totally change the business of the country. All over these beds of coal, will be miners' towns. In the valleys below the coal fields, will be large iron mills, and all along the lines of railway, extending out South, and in daily communication with the coal fields, the world's great staple, in its raw state, will be manufactured. The above figures about the supply of coal have been made without any direct reference to the development in iron, which undoubtedly will soon be the greatest source of demand, as the country adjacent to these coal fields, taking into the account the variety of ores, the iron is perhaps not surpassed by any portion of the United States." The report was adopted.

The Committee on Demand and Supply, through Milo Pratt, the Chairman, submitted the following:

"That, from all statistics and facts they have been able to obtain, and a careful estimate where facts could not be had, we find that the section embracing Nashville, and all points this side as far as Stevenson, and from that point west on the Memphis and Charleston Railroad as far as Grand Junction, will require 175,900 tons. Of this amount, about 60,000 is furnished by the river or water communication, the balance, 125,000 tons, by rail. Taking Knoxville on the north, thence south and east, including Chattanooga, and as far south as Montgomery, Columbus, Macon, Augusta, and all intermediate points, it will require fully 150,000 tons. These figures have been arrived at by absolute sales and orders received from the principal points mentioned, and a careful estimate of intermediate points, it is confidently believed that the amount named is under the real year's demand. Your Committee will add that to move this amount of coal will require 34,375 car loads, of eight tons each. That, allowing a car 7½ days to deliver each car load, and counting 300 working days per annum, it will require 850 cars to perform this service. Taking the amount consumed from Knoxville south, including Chattanooga, and upon the above basis it will require 468 cars. The present amount of coal that is moved South per day below Dalton does not average over 17 cars per day; to fill the present demands it will require 52 per day. The demand for the incoming year will undoubtedly be so great as to double that of the current year, and consequently the number of cars required will be not less than 1,700." Report adopted. The subject of pro-rating between the several roads was next discussed, and resolutions were adopted asking the co-operation of the various railroad companies to aid, by cheap rates of transportation and cars, the progress of the movement. After appointing a committee of five to confer with Le Barron Drury upon the practicability of supplying Brunswick with coal, with a view to making that port a regular coal station for Atlantic steamers, the convention adjourned *sine die*.

## Maryland.

THE GOLD DEPOSITS OF MONTGOMERY COUNTY.

CABINET OF PRACTICAL GEOLOGY AND MINING,
U. S. GENERAL LAND OFFICE,
WASHINGTON, D. C. Nov. 23, 1869.

TO THE EDITOR:

Sir—Montgomery County, Maryland, once more asserts her claim to be a gold-bearing region. A nugget of gold estimated to be worth $175 was recently found on Mr. Davidson's farm, and sent to this office for examination. It weighs 9.4 oz. 8 dwt. 11 grs., and measures 3⅜ inches in length, 2 6-8 inches in width, and averages about ¼ inch in thickness. The matrix is hard granular quartz, which is browned by the decomposition of iron pyrites. Deducting the amount of quartz, which would weigh nearly ¾ of an ounce, shows the gold to be of the above mentioned value. In general aspect the quartz closely resembles that which was excavated from the ledge worked for some time by a company in the vicinity of the Great Falls of the Potomac, and corrrespond in every respect with samples of gold bearing quartz from various localities in Montgomery County, deposited in this Cabinet. The nugget was barely covered with earth in loose gravelly loam, resting on auriferous pieces of quartz. Gold nuggets are usually found in river beds, in parts where the water has a rapid fall near the place of its origin, at the base of steep hills, in excavations, or where the river beds become wider in shallows: the gold contained in them is not often of the finest quality, but the reverse.

This auriferous locality is concurrent with the position of all similar deposits on the eastern slope of the Apalachian chain. The character of the rocks of the county is well exhibited by the section of them exposed by the Baltimore and Ohio Railroad. Begining near Ellicott's Mills on the Patapsco River, in a perfect nest of granite, trap hornblende rocks, it is but a short space before an irruption of serpentine rocks is arrived at, which formation in another part of the State yields valuable deposits of chrome ore, then more hornblende rocks, steatite, talcose slate and granite, in which connection it is supposed the gold deposits exist. Where these rocks in their southwestern trend cross at the Great Falls of the Potomac, gold quartz have been found at different periods, and the late Prof. E. Hitchcock, of Williams College, Mass., declared, after a visit to that remarkable place, that the rocks there are identical with the most celebrated auriferous deposits of other countries.

Besides the geological features above referred to, this county has other claims to consideration from capitalists, in the deposits of magnesian mineral for making epsom salts and calcined magnesia; in its beds of porcelain clay or kaolin for making queensware crockery; its limestone quarries, the latter giving employment to large works in Baltimore, in preparing it for hearths, tables, shelves, linings for grates, bath tubs, &c., &c. Rich deposits of copper, magnetic oxide of iron, plumbago; and at Seneca Creek we come upon the celebrated free stone quarries which, in this part of the world, supply the same material for building which in the North is derived from the Connecticut valley.

A. R. ROESSLER,
Geologist, General Land Office.

## Michigan.

THE COPPER MINES.

There are now at work in Ontonagon county, says the *Miner*, the National, Minnesota, Flint, Steel, Caledonia, Evergreen, Ridge, Nonesuch, and Union mines, by the companies; Rockland, Knowlton and Norwich, on tribute; and the Victoria, under some special arrangement, by Mr. Ball. These mines, worked by the corporations themselves, are showing well, are virtually self-sustaining, although not paying dividends. The chief work on each location seems to be the opening of the property preparatory to more extended operations when brisk times shall warrant.

## BUSINESS AND PERSONAL.

[*Short notices in this column fifty cents per line each insertion.*]

IRON AND STEEL MANUFACTURE.—CLAIM OF PATENT No. 97,897 in the manufacture of Iron and Steel, subjecting the mass of molten metal to the action of hydrogen gas alone, forced up through the mass in combination with a current or currents of atmospheric air or oxygen, introduced over the molten metal within a chamber of reflecting character, producing combustion of the carburretted hydrogen, phosphuretted hydrogen, &c., above the metal, substantially as and for the purpose specified. WILLIAM ENNIS, Patentee and owner of this process, wishes to call the attention of manufacturers to the above claim. WILLIAM ENNIS,
Jan11-1m Thirty-ninth street, north of Bridge street, Philadelphia.

GLYNN'S ANTI-INCRUSTATION FOR STEAM BOILERS.—The only reliable article for removing and preventing incrustations. No foaming, and does not attack metals of boilers. Liberal terms to agents. C. D. FREDRICKS,
Dec. 21, tf. 587 Broadway, New York.

## MARKET REVIEW.

### The Coal Trade.

NEW YORK, Jan. 14, 1870.

WHOLESALE.—There is no demand for either Anthracite or Bituminous coal. The general unsettled state of affairs in the mining regions, rumors of strikes, reduction of tolls and freights, and the unseasonable weather, may be assigned as the causes. There is no confidence among dealers, and all the doings in the trade are entirely speculative. There is a large supply of coal in the market, and we would not be surprised to be compelled to quote a further reduction in prices next week.

The strike in the Schuylkill region, in consequence of the dissatisfaction of the miners with the new scale of wages proposed by the Anthracite Board of Trade (noted in our last issue), and the reduction of fifty cents per ton on through tolls by the Reading Railroad, has had no effect in this market, in consequence of the very small quantity of coal that was being sent forward before the changes were made. In fact, the whole thing was anticipated and discounted.

The market was a little exercised to-day in consequence of the announcement that the Lehigh Valley Railroad and New Jersey Central Railroad had agreed upon a reduction of freights on all through coal from Penn Haven of fifty-seven (57c.) cents, to take effect from last Monday, the 10th inst. This has thoroughly disheartened all holders of large quantities of coal, both here and at the East, and will in all probability cause a re-arrangement of prices for this (January) month.

The Pottsville *Miners' Journal*, which, by-the-bye, comes to us this week in a new and handsome dress, thus talks of matters in its locality: "There are but few collieries at work in this region, as the shipments indicate. The operators are trying to square up last year's business, which, we learn, does not turn out very profitable. Notwithstanding the advanced prices obtained for coal for several months, the high wages paid, and the high rates of transportation, have eaten up all the profits. A meeting of the Workingmen's Benevolent Association was held at Mahanoy City on Thursday. Nothing was done, but an interchange of sentiment took place. A joint meeting of the Anthracite Board of Trade and delegates of the W. B. Association was held in this borough this afternoon (Friday), to confer together on the Basis question. We will endeavor to obtain the proceedings for our late news, if any arrangement should be agreed upon.

"Since the above was in type, we learn that the meeting of the committees, after general consultation, adjourned without taking any action, to meet again on Wednesday next. The Duncan Coal Company, we learn, have abandoned their colliery. This was the deepest worked colliery in the region, on the Duncan tract, a short distance above the borough of Pottsville, the depth being 1,400 feet on the inclination of the vein. The coal is known as the Spohn Red Ash, the finest Red Ash coal produced in this region. The vein, we learn, was about eight feet thick at the bottom of the slope, and another lift of about 300 feet would have carried the slope to the bottom of the basin. By abandoning the colliery, they in effect abandon the property for mining purposes, because these workings will all fill up with water, which it will never pay to pump out again, and no colliery can be carried on near these workings for fear of the immense body of water breaking through and drowning all in the mines."

The Wilkesbarre *Record of the Times* reviews the situation as follows: "Schuylkill county is in trouble, and collieries are abandoned because the owners cannot afford to work them with coal so low and wages so high. The cost of mining and transportation is not covered by the price in market while the large companies in this region owning both coal and railroads make a handsome profit. The great suspension of 1869 has failed of any permanent advantage, the reaction in prices leaving the operators like vessels stranded at low tide, in worse condition than before the rise. The Lackawanna companies have the whip-hand now, and their adversaries need expect no quarter. If from all this the people reap any benefit in continued low prices, something will be gained; but when the seaboard needs one thousand tons of coal more than is at tide, we very much fear that the auction sales will register the fact and result in a rise of one or two dollars a ton on a million of tons. This will brighten up Schuylkill trade for a time, but before the deep mines can be pumped out, and rusted machinery be started the coffers of more fortunate operators will be full and prices will settle to a non-paying basis again. In the meantime, Lackawanna companies stretch out long arms and absorb the best lands of Luzerne. It is rumored that the Hollenback Company has yielded to the seductive influences of the Wilkesbarre Coal and Iron Company, and one of the Scranton companies combined and has changed hands. The facilities for transportation by the Lehigh and Susquehanna and the Delaware Lackawanna and Western railroads having wharfage at Hoboken by the Morris and Essex road and at Elizabethport by the New Jersey Central, will give the Hollenback lands a greater value in the hands of the company, as owners, than they can possibly have while merely leased. The Wilkesbarre Coal and Iron Company pays thirty thousand dollars a year rent. With the new openings projected they may do a business to pay a hundred thousand a year at the present rate, and it will be economy to own the land if they can get it. The Delaware and Hudson Canal Company now own nearly every thing from Mill Creek to Wilkesbarre, the Delaware, Lackawanna, and Western, and the Lehigh Coal and Navagation Companies having pretty nearly the whole field below, on the East side of the river, and a large share of the West side. It is not easy to say what collieries some one of these three companies does not control the destinies of, unless it may be those under control of the Lehigh Valley and Pennsylvania companies. So we narrow down rapidly."

RETAIL.—Trade has been dull except with the large companies who are yet offering coal at $6 50 and $7 00 delivered.

The editor of the Coal Department is about preparing his annual review of the trade for 1869. Persons who have control of statistics, public or private, who would like to have the same appear, will please send them in at as early a date as possible.

THE DUTY ON COAL TO REMAIN UNCHANGED.

WASHINGTON, Jan. 14.

The Committee on Ways and Means to-day refused, by a vote of two against six, to make bituminous coal free. They rejected the motion for fifty cents a ton by a vote of three against five. The proposition for one dollar a ton was lost by a tie vote. Coal will, therefore, remain as now.

### Anthracite Coal Trade for 1869 and 1870.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending January 8th, 1870, compared with week ending January 9, 1869.

| COMPANIES. | 1869. WEEK. | 1869. TOTAL. | 1870. WEEK. | 1870. TOTAL. |
|---|---|---|---|---|
| *Phila. & Reading R.R. | 14,641 | 215,964 | 13,034 | 261,313 |
| †Schuylkill Canal | | | | |
| Lehigh Valley R. R. | 38,638 | 194,651 | 37,458 | 264,820 |
| Lehigh and Sus. R. R. | 16,276 | 16,276 | 15,459 | 15,459 |
| †Lehigh Canal | | | | |
| Scranton North | 10,071 | 10,071 | 12,973 | 12,973 |
| " South | 32,301 | 32,301 | 24,849 | 24,849 |
| Penn. Coal Co., rail | 14,215 | 16,177 | 16,807 | 17,065 |
| † " " canal | | | | |
| Del. and Hudson, rail. n | | | 10,991 | 10,991 |
| " " " south | | | 997 | 997 |
| Shamokin | 4,733 | 4,733 | 4,202 | 4,202 |
| Trevorton | 459 | 459 | 497 | 497 |
| Short Mountain | 585 | 585 | 500 | 500 |
| Lykens Valley Canal Co. | 1,593 | 1,593 | 1,200 | 1,200 |
| †Wyoming South | | | | |
| † " North | | | | |
| P. N. Y. C. & R. R. Co. | | | 3,329 | 17,209 |
| Williamstown, Col'y | 1,231 | 1,231 | 3,548 | 3,548 |
| Total | 134,893 | 494,041 | 145,642 | 636,411 |
| 1870 | | | | |
| Decrease year | | | | In. week. |

* Less coal transported for Company's use and Bituminous coal.

† Closed for the Season.

### Bituminous Coal Trade, 1869 and 1870.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Jan. 8, 1870, compared with week ending Jan. 9, 1869.

| COMPANIES. | 1869. Week. | 1869. Year. | 1870. Week. | 1870. Year. |
|---|---|---|---|---|
| B. & O. R. R. | | | 1,660 | 1,660 |
| C. & O. Canal | | | | |
| H. & B. S. R. R. | 4,055 | 4,055 | 4,181 | 4,181 |
| Harrisburg D. & D. | | | 5,387 | 41,097 |
| L. V. R. R. | | | | |
| C. & N.Y. C. & R. Co. | | | 3,090 | 19,038 |
| | 4,055 | 4,055 | 14,318 | 65,976 |

### Schuylkill Coal Trade.

Report of Coal transported via the P. and R. R. for the week ending Jan. 6, 1870—less coal carried for Company's use, and Bituminous Coal:

| | |
|---|---|
| For week | 13,033 12 |
| Previously this year | 248,279 02 |
| Total | 261,312 14 |
| Same time last year | 215,964 00 |
| Decrease | 45,348 14 |
| Amount sent same week 1868 | 14,641 00 |

Report of coal transported on the Philadelphia and Reading Railroad for the week ending Thursday, January 6, 1870:

| | |
|---|---|
| From St. Clair | |
| " Port Carbon | 1,337 01 |
| " Pottsville | 1,615 01 |
| " Schuylkill Haven | 3,244 08 |
| " Auburn | 279 10 |
| " Port Clinton | 6,436 06 |
| " Allentown and Alburtis | 119 06 |
| " Harrisburgh and Dauphin | 5,387 00 |
| Total paying freight | 18,420 12 |
| Coal for Company's use | 1,151 12 |
| Total for week | 19,572 04 |
| To same time last year | 296,677 02 |
| Total | 316,249 06 |
| To same time last year | 216,886 01 |

### Harrisburgh and Dauphin Coal Trade.

The following is the amount of Bituminous Coal transported via the P. and R. R. for the week ending Jan. 6, 1870:

| | Tons. |
|---|---|
| For week | 5,387 00 |
| Previously this year | 35,709 17 |
| Total | 41,096 17 |

### Penn. and N. Y. Canal and Railroad Co.

REPORT of Coal Transported via the Pennsylvania and New York Canal and Railroad Company, for week ending January 8th, 1870:

| | |
|---|---|
| Anthracite | 3,328 12 |
| Previously this year | 13,889 14 |
| Total | 17,229 06 |
| Bituminous | 3,090 00 |
| Previously this year | 15,948 00 |
| Total | 19,038 00 |

### Report of Coal Transported over Lehigh and Susquehanna Railroad.

Week ending January 8th, 1870—Compared with same time last year.

| WHERE SHIPPED FROM | WEEK, 1870. tons cwt | WEEK, 1869. tons cwt | YEAR, 1870. tons cwt. | YEAR, 1869. tons cwt |
|---|---|---|---|---|
| Wyoming Region | 8870 01 | 9893 15 | | |
| Upper Lehigh Region | 253 06 | 2900 04 | | |
| Hazleton Region | 144 17 | 159 16 | | |
| Mauch Chunk Region | 6184 10 | 3302 02 | | |
| Totals | 15452 14 | 16275 17 | | |
| Increase | | | | |
| Decrease | 817 03 | | | |
| DISTRIBUTION. | | | | |
| Forwarded East of Mch Chunk by Rail | 15015 16 | 15167 10 | | |
| Delivered at and above Mauch Chunk | 423 11 | 834 01 | | |
| Delivered to L. & B. R. R. at Plymouth Bridge | 9 07 | 274 06 | | |
| Totals | 15452 14 | 16275 17 | | |
| Of the above there was from Company's Mines | 8643 19 | 8302 02 | | |
| Increase | 341 17 | | | |

### Report of Coal Transported over Lehigh Valley Railroad

For the week ending January 8th, 1870, and previously this season, compared with same time last year:

| WHERE SHIPPED FROM. | WEEK. Tons. Cwt. | PREVL'Y. Tons. Cwt. | TOTAL. Tons. Cwt. |
|---|---|---|---|
| Total Wyoming | 7,896 02 | 49,400 00 | 57,296 02 |
| " Hazleton | 24,536 16 | 115,820 07 | 140,357 03 |
| " Upper Lehigh | | | |
| " Beaver Meadow | 6,052 02 | 49,158 04 | 55,210 06 |
| " Mahanoy | 3,879 06 | 33,583 09 | 37,462 15 |
| " Mauch Chunk | 34 10 | 161 04 | 195 14 |
| Total Anthracite | 42,378 16 | | 290,512 00 |
| Bituminous Coal recv'd from Cata. R. R. | | | |
| N. C. R. R. | | | |
| E. P. R. R. | | 1,743 00 | 1,743 00 |
| P. & N. Y. C. & R.R. Co | | | |
| Fall Creek | | | |
| Schroeder | | | |
| Towanda | | | |
| Total by rail and canal | 42,378 16 | 249,876 04 | 292,255 00 |
| Same time last year | 38,686 00 | 172,936 06 | 211,694 06 |
| Increase | 3,680 16 | 76,879 18 | 80,560 14 |
| Decrease | | | |
| Forwarded East from M'h Chunk by rail | 37,458 10 | 27,361 03 | 292,255 00 |
| Same time last year | 36,468 07 | 158,183 03 | 211,694 06 |
| Increase | 990 10 | 69,178 00 | 80,560 14 |

RECAPITULATION.

| | | | |
|---|---|---|---|
| Forwarded East from M'h Chunk by rail | 37,458 10 | 227,361 03 | 264,819 13 |
| To N. C. R. R., at Mount Carmel | | 115 00 | 115 00 |
| Forwarded North from L. & B. Junction | 3,328 12 | 13,470 17 | 16,799 09 |
| To L. & S. R. R. at Packerton for rail | 88 18 | 518 14 | 607 12 |
| Delivered at M'h Chunk | 21 15 | 125 00 | 146 15 |
| Delivered on line of road above Mauch Chunk | 567 10 | 778 11 | 1,346 01 |
| Delivered above M. Chunk for use of L. V. R.R. | 913 11 | 5,108 10 | 6,023 01 |
| To L. & S. R.R., at P'n Hav., for railroad | | | |
| Do. for canal | | | |
| At M.Chunk for canal | | 655 09 | 655 09 |
| Total Anthracite | 42,378 16 | 248,133 04 | 290,512 00 |
| Bituminous Coal | | 1,743 00 | 1,743 00 |
| Total all kinds | 42,378 16 | 249,876 04 | 292,255 00 |

### Cumberland Coal Trade.

B. & O. RAILROAD

The shipments over the Baltimore & Ohio Railroad for the week ending Jan. 8, 1870, were as follows:

| From Georges Creek via Piedmont. | Tons. |
|---|---|
| Consolidation Co | 440 07 |
| Borden Co. | 249 03 |
| Balt. & Hampshire Co. | 334 01 |
| Maryland Co. | |
| From Eckhart R. R. | |
| C. C. & I. Co. | 636 06 |
| Total | 1,659 17 |

Statement of coal transported over the Cumberland and Pennsylvania Railroad during the week ending Saturday, Dec. 31, and during the year 1869, compared with the corresponding period of 1868:

WEEK.

| YEAR. | C. & O. CANAL. Tons. Cwt. | B. & O. R. R. Tons. Cwt. | TOTAL. Tons. Cwt. |
|---|---|---|---|
| 1869 | | 25,352 00 | 25,352 00 |
| 1868 | | 28,719 07 | 28,719 07 |
| Increase | | | |
| Decrease | | 3,367 07 | 3,369 07 |

YEAR.

| YEAR. | C. & O. CANAL. | B. & O. R. R. | TOTAL. |
|---|---|---|---|
| 1869 | 573,243 17 | 998,625 11 | 1,571,869 08 |
| 1868 | 424,405 07 | 646,490 11 | 1,070,895 18 |
| Increase | 148,838 10 | 352,135 00 | 500,973 10 |
| Decrease | | | |

### Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

| SCHUYLKILL. | AT NEW YORK, Jan. 14. R. A. | W. A. | AT PHILADELPHIA, Jan. 13. R. A. | W. A. |
|---|---|---|---|---|
| Lump | $— — | $5 50 | 5 50 | 5 50 to 5 75 |
| Steamer | — — | 5 50 | — — | 5 00 to 5 25 |
| Broken | — — | 6 00 | — — | — — to 5 — |
| Egg | 7 50 to — — | 6 50 | — — | 5 00 to 5 25 |
| Stove | 7 00 to — — | 7 00 | — — | 5 25 to 5 50 |
| Chestnut | 5 50 to — — | 5 00 | — — | 4 75 to — — |
| Pea | — — | — — | — — | — — |
| LEHIGH. | | | | |
| Lump | — — | 7 10 | — — | — — |
| Steamer | — — | — — | | — — |
| Broken | — — | 6 60 | — — | — — |
| Egg | — — | 7 00 | — — | — — |
| Stove | — — | 8 10 | — — | — — |
| Chestnut | — — | 6 10 | — — | — — |
| Pea | — — | — — | — — | — — |
| SPECIAL COALS.* | | | | |
| Diamond Vein | R. A. | 6 50 | — — | — — |
| New England | " | — — | — — | — — |
| Locust Dale | W. A. | 6 00 | — — | — — |
| Honey Brook, Leh | W. A. | 5 50 to 6 25 | — — | — — |
| Spring Mount. | " | 5 50 to 6 25 | — — | — — |
| Sugar Creek | " | 5 50 to 6 25 | — — | — — |
| Sugar Loaf | " | 5 50 to 6 25 | — — | — — |
| Fulton | " | 5 50 to 6 25 | — — | — — |
| Stout | " | 5 50 to 6 25 | — — | — — |
| Old Comp'y's. | " | 5 50 to 6 25 | — — | — — |
| Cross Creek | " | 5 50 to 6 25 | — — | — — |
| Hauncey | " | " | — — | — — |
| Girardville | " | " | — — | — — |
| McMichael | " | " | — — | — — |
| Shamokin | " | " | 6 50 | 5 75 |
| Lykens Valley | " | " | — — | — — |
| Broad Top | " | " | — — | 5 00 |
| Hill & Harris | " | " | — — | 5 75 |
| Henry Clay | " | " | — — | 6 00 |
| Powelton | " | " | — — | 5 50 |
| BITUMINOUS COALS. | | | | |
| Kittaning Coal Co.'s Phœnix Vein f.o.b. at Phila | | | | $5 25 |
| Lemon | | | | 5 00 |
| Cumberland C. & I. Co.'s on board | | | N. Y. | 7 50 |
| Central C. & M. Co.'s | | | " | 7 50 |
| Consolidated Coal Co.'s | | | " | 7 50 |

[*Dealers in these coals may be found in our advertising columns.]

### Company Coals.

| | L. | Str. | Gra. | Eg. | Sto. | Ches. |
|---|---|---|---|---|---|---|
| Scranton at E. Port | — — | — — | — — | — — | — — | — — |
| Pittston at N. Y | 6 30 | 6 30 | 6 40 | 6 40 | 7 25 | 6 10 |
| Lackawana at Weh'kn. | 5 50 | 5 75 | 6 00 | 6 00 | 6 50 | 5 50 |
| Wilk'b're at Hoboken. | 5 50 | 5 75 | 6 00 | 6 00 | 6 50 | 5 50 |
| Old Co. Lehigh at Pt. Johnston | 6 75 | 6 00 | 6 00 | 6 00 | 7 25 | 6 50 |
| Lehigh at E. Port | 6 25 | 5 50 | 5 50 | 5 50 | 6 25 | 5 25 |

For freights to different points, see "Freights."

### Prices for Coal at Mauch Chunk.

| | F.L. | Bro. | Gra. | Eg. | Sto. | Cst. |
|---|---|---|---|---|---|---|
| Lehigh | $0 00 | $0 00 | $0 00 | $0 00 | $0 00 | $0 00 |
| Wilkesbarre | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 |

For freight to Elizabethport and to New York see "Freights."

### Rates of Transportation to Tide Water.

*BY RAILROAD.*

TO PORT RICHMOND, PHILADELPHIA.

| | |
|---|---|
| Philadelphia and Reading Railroad, from Schuylkill Haven | $2 00 |
| From Port Carbon, 8 cents per ton more. | |
| TO ELIZABETHPORT. | |
| L. V. Railroad from Mauch Chunk to Easton | $1 15 |
| C. R. R., N. J., Easton to Elizabethport | 1 70 |
| Shipping expenses at Elizabethport | 25 |
| Total | $3 10 |
| TO PORT JOHNSON. | |
| L. V. R. R. | $1 15 |
| C. R. R., of N. J. | 1 80 |
| Shipping expenses | 25 |
| Total | $3 20 |
| TO HOBOKEN. | |
| L. V. R. R. | $1 15 |
| Morris & Essex R. R. | 1 80 |
| Shipping expenses | 25 |
| Total | $3 20 |
| TO SOUTH AMBOY. | |
| L. V. R. R. | $1 15 |
| E. & D. R. R. | 1 10 |
| Cam. & Am. R. R. | 50 |
| Shipping Expenses | 25 |
| Total | $3 00 |

### Freights.—JANUARY, 1870.

| TO EASTERN PORTS. | From Philadel'a. | From E Port and Port Johnson. | From Newburg | From Rondout |
|---|---|---|---|---|
| Stamford | $2 00 | $1 10 | $ | $ |
| Norwalk | 2 25 | 1 15 | | |
| Bridgeport | 2 00 | 1 10 | | |
| New Haven | 2 25 | — — | | |
| Hartford | 2 75 | | | |
| New London | 2 00 | 1 40 | | |
| Norwich and Sou. | 2 00 | 1 50 | | |
| Mystic | 2 00 | — — | | |
| Stonington | 2 00 | 1 40 | | |
| Sag Harbor | 2 00 | 1 10 | | |
| Bristol | 2 50 | 1 40 | | |
| Newport | 2 50 | 1 40 | | |
| Fall River | 2 50 | 1 40 | | |
| Providence | 2 50 | 1 40 | | |
| Dighton | — — | — — | | |
| Warren | — — | — — | | |
| Pawtucket | 2 25 | — — | | |
| New Bedford | 2 25 | 1 40 | | |
| East Cambridge | 3 00 | — — | | |
| Salem | 3 00 | 2 00 | | |
| Newburyport | 3 10 | 2 00 | | |
| Portsmouth, N. H. | 3 35 | 2 00 | | |
| Rockport | — — | — — | | |
| Saco | 3 00 | 2 00 | | |
| Portland | 3 00 | 2 00 | | |
| Bangor | 3 00 | — — | | |
| Bath | 3 00 | 2 00 | | |
| Middletown | — — | — — | | |
| Amesbury | 3 25 | — — | | |
| Boston | 3 15 | 2 00 | | |
| Cambridgeport | 3 00 | — — | | |
| Taunton | 3 10 | 2 00 | | |
| Derby | 2 00 | — — | | |
| New York | 1 75 | 50 | | |
| Hackensack | 1 95 | — — | | |
| Jersey City | 1 75 | 50 | | |
| TO RIVER PORTS. | | | | |
| Troy | — — | — — | | |
| Albany | — — | — — | | |
| Coeyman's | — — | — — | | |
| Stuyvesant | — — | — — | | |
| Cocksackie | — — | — — | | |
| Hudson | — — | — — | | |
| Catskill | — — | — — | | |
| Poughkeepsie | — — | — — | | |
| Fishkill | — — | — — | | |
| Cold Spring | — — | — — | | |
| Haverstraw | — — | 50 | | |
| Nyack | 1 60 | 50 | | |
| Sing Sing | 1 60 | — — | | |
| Yonkers | — — | 40 | | |
| New York | — — | — — | | |
| Saugerties | — — | — — | | |
| Rhinebeck | — — | — — | | |
| Rondout | — — | — — | | |
| Tarrytown | 1 60 | 80 | | |
| West Point | — — | — — | | |

### METALS.

IRON.—Duty: Bars, 1 to 1¼ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

| | |
|---|---|
| Pig, Scotch No. 1, ₱ ton | — —@34 00 |
| Pig, American, No. 1 | — —@35 — |
| Pig, American, No. 2 | 34 —@— — |
| Pig, American, Forge | 33 —@— — |
| Bar, Refined, English and American | — —@82 50 |
| Bar, Swedes, assorted sizes (gold) | 80 00@82 50 |
| *Store Prices.* | |
| Bar, Swedes, ord'y sizes, less 5 ₱ ct. | 120 —@130 — |
| Bar, Refined " " | 85 —@— — |
| Bar, Common " " | — —@ 80 — |
| Scroll " " | 110 —@135 — |
| Ovals and half-round " " | 110 —@— — |
| Band " " | 110 —@— — |
| Horse Shoe " " | 1 ¼—@— — |
| Rods, ⅛ to 3-16 inch " " | 90 —@140 — |
| Hoop " " | 115 —@160 — |
| Nail rod, less 5 ₱ ct. | — 8—@— 8½ |
| Sheet, Russia, as to Nos. (gold) | — 11—@—12— |
| Sheet, Single, D. and T. Common | — 5½@— 7 |
| Sheet, Galvanized | List 15@25 ₱ cent. discount |
| Rails, English (gold), ₱ ton | 56 50 @58 00 |
| Rails, American, at Works in Pa. | 76 00 @77 00 |

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb. and 10 ₱ cent ad val. (Store prices.)

| | |
|---|---|
| English Cast (2d and 1st quality) ₱ lb | — 16 @— 20 |
| English Spring (2d and 1st quality) | — 7 @— 13 |
| English Blister (2d and 1st quality) | — 11 @— 18 |
| English Machinery | — 11½@— 14 |
| English German (2d and 1st quality) | — 13 @— 15 |
| American Blister "Black Diamond" | — 10½@— 16 |
| American, Cast, Tool do. | — 19 @— — |
| American, Spring, do. | — 10 @— 13 |
| American Machinery, do. | — — @— 13 |
| American German, do. | — 10 @— 13 |

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper cents ₱ lb; Manufactured, 45 per cent. ad val.

| | *All Cash.* |
|---|---|
| Copper, New Sheathing, ₱ lb | — @— 32 |
| Copper Bolts | — @— 33 |
| Copper Braziers, 16oz. and over | 33 @— 35 |
| Copper Nails | 38 @— 40 |
| Copper, Old Sheathing, &c., clean | 18 @— 18 |
| Copper, Chili Pig | — @— — |
| Copper, American Ingot | 21⅛@— 21⅝ |
| Yellow Metal, New Sheating | — @— 27 |
| Yellow Metal Bolts | — @— 27 |
| Yellow Metal Nails | — @— 27 |

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2½ cents ₱ lb.

| | |
|---|---|
| Galena, ₱ 100 lbs. | $— —@— — |
| Spanish (gold) | 6 25 @6 37½ |
| German, do. | 6 50 @6 37½ |
| English, do. | 6 25 @6 75 |
| Bar (net) | — — @ 8 . 7½ |
| Pipe and Sheet (net) | — — @ 8 37½ |

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent. ad val.

| | *Gold* ₱ lb. |
|---|---|
| Banca | 31 @— |
| Straits | 31 @31¼ |
| English | 29⅞@30 |

PLATES.

| | *Fair to Good Brands.* Gold. | Currency. |
|---|---|---|
| I. C. Charcoal, ₱ box | $8 00 @8 25 | $10 25 @10 75 |
| I. C. Coke | 6 75 @7 37½ | 8 . @ 9 50 |
| Coke Terne | — — @6 00 | — @ 8 00 |
| Charcoal Terne | 7 25 @8 00 | 9 . @10 25 |

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ₱ 100 lb.

| | *Gold.* |
|---|---|
| Plates, Foreign | ₱ 100 lbs. $6 12½@6 25 |
| Plates, Domestic | ₱ lb. 10 @— 12 |

REMARKS.

TIN.—Pig remains entirely neglected, and prices of Straits and Banca are wholly nominal; we notice the sale of eight tons English at 29⅞ cents, gold. The market for Plates, after a long season of inactivity, has become more animated, and the business has been large, at prices a little below those before nominally current; in smaller parcels, however, there is no quotable change in prices, and we retain our previous quotations. The transactions embrace 7,500 bxs. assorted Charcoal Tin and Terne, mostly the former, and 500 do. I. C. Coke Tin, 14 by 20, on private terms; and 500 do., in bond, $5 75, gold.

COPPER.—New Sheathing is steady at 32 cents, and Yellow Metal 27c., cash. The market for Ingot is at a stand, and we hear of no business; the nominal price of Lake Superior is 21⅞ @ 21¾ cents.

IRON.—The market for Scotch Pig remains quiet, the demand being confined to small lots to supply the immediate wants of dealers, at prices previously current; we have only to notice a sale of 50 tons Glengarnock at $34 50 from yard. The demand for American has almost entirely subsided, and prices are unsettled; 500 tons No. 1 sold at $35. Bar from store continues very quiet at about our quotations

we note sales, recently, of 400 @ 500 tons Anthracite Blooms at $91 @ $91 50, and 200 @ 300 tons prime Charcoal do., $102 at forge, but the market will hardly now bear these quotations.

LEAD.—Pig is in very limited demand, but in prices there is no change; 100 tons Spanish sold on private terms. Bar, Sheet and Pipe are nominally 8¼ cents net cash, the tendency being to a lower quotation.

STEEL.—Is without change or improvement.

ZINC.—American oxide, 8c. @ 8½c.; French do., 11¼c. @ 11½c.; Metallic, 11¼c. @ 12c.

MANGANESE.—Pembroke black oxide lump 4½c., and powdered 5c. per lb.

### Mining Stocks.

NEW YORK, Jan. 14, 1870.

Prices continue to advance under the influence of a more active market. Sales of Gregory were made yesterday, b 60, at $2 05. Smith & Parmelee, and Quartz Hill, although quoted at higher figures, sold yesterday at $1 85, and 74c., respectively. Semmenderfer, in days gone by one of the most prominent of Colorado stocks, is again quoted in our list.

Copper stocks continue without quotations in this market.

Petroleums have recovered from their recent decline, and are now quoted at the following advanced rates:

| | Bid. | Asked. |
|---|---|---|
| Bennehoff | — | — |
| Brevoort | 1 25 | 1 63 |
| Buchanan Farm | 30 | 45 |
| Clinton Oil | — | 3 50 |
| Central | 35 | 70 |
| Home Petroleum | 5 85 | 6 20 |
| National | — | — |
| New York and Alleghany | 1 40 | — |
| Northern Light | 55 | 80 |
| Rathbone Oil | 20 | — |
| Rynd Farm | 40 | 80 |
| Pithole Creek | — | — |
| United Petroleum Farms | 19 | 22 |
| United States | 75 | — |
| Bergen Coal and Oil | 25 | 50 |
| Second National | 50 | 75 |

### San Francisco Stock Market.

SAN FRANCISCO, January 14, 1870.

| (By Telegraph.) | 1st Board. | 2d Board. |
|---|---|---|
| Savage | 43½ | 45½ |
| Crown Point | 13¼ | 13½ |
| Yellow Jacket | 54⅛ | 54⅜ |
| Kentucky | 1 36 | 1 34 |
| Cholar Potosi | 18½ | — |
| Gould & Curry | 60 | — |
| Ophir | 13⅝ | 14¼ |
| Alpha | — | — |
| Belcher | 15⅛ | — |
| Imperial | 42 | 41 |
| Hale & Norcross | 1 59 | 1 53½ |
| Amador | — | — |

### Improved Iron and Steel Process.

THE Troy *Daily Press* is responsible for the following: "For a few days past, interesting experiments in the manufacture of wrought iron and steel have been going on at the Rensselaer Iron Works, which have thus far been attended with such unusual success that the new process bids fair to supersede the unreliable and tedious methods which are now in generat use.

"Dr. WILLIAM FIELDS, of Wilmington, Del., is the inventor, or rather the discoverer, of the new process. Mr. FIELDS is a gentleman of pleasing appearance, sixty-five years of age. He has a massive head, well-set features, and that peculiar sharpness of expression which is characteristic of the 'Yankee.' He has been a practising physician at Wilmington for the past forty years, and is the inventor of various machines and processes. Among these he has invented a new steam engine, a blasting powder of unusual power, a propeller for towing on the canal, a process for generating steam, and of melting iron, whereby—as he claims—a saving of sixty per cent. of fuel is made. Dr. FIELDS has not brought these inventions before the public to any extent. About six months ago, as he says, he conceived the idea one day that steel and wrought iron could be made in the puddling furnace, and in such a manner that chemicals would do the work and supersede the tedious and laborious process at present in use.

"The doctor gave the matter two or three hours' attention one evening, and finally selected certain chemicals or ingredients, of which he formed powders. He experimented with these, and found that by the use of his ingredients he could manufacture both wrought iron and steel. He visited this city recently, and desired to test his process in this community of iron-workers. Messrs. JOHN A. GRISWOLD & Co. kindly permitted Dr. FIELDS to test the process at the Rensselaer Iron Works, granting every facility for the purpose, and we would say that the doctor expressed himself as deeply grateful to the proprietors of the mills, and also to Colonel BABCOCK, the superintendent; Mr. ERASTUS H. VAUGH, assistant superintendent; and Mr. HUGH TRAINOR, Jr., foreman of the puddling department, for their kindness in assisting him in his experiments.

"The process of manufacturing wrought iron and steel is simply as follows: Dr. FIELDS charges one of the ordinary puddling furnaces located at the iron works, with a quantity of American pig iron; when the iron is thoroughly melted, Dr. FIELDS throws into the seething mass a small package of powdered substances, which unite, by chemical action, with the sulphur or phosphorous of the iron, and then pass off in the form of gases, leaving the iron free from injurious ingredients. The iron thus becomes tough and strong, and can be rolled or worked with ease and facility. To work iron of a superior quality, it is necessary to free it from sulphur or phosphorus, and Dr. FIELDS claims—and experiments seem to verify his claims—that by his process the work of eliminating these constituents is quickly and thoroughly performed.

"To manufacture steel, the iron is melted in an ordinary puddling furnace; the sulphur and phosphorus are driven off, as in the previous process; another package of different chemicals is then thrown into the furnace and thoroughly incorporated with the mass, and in ten minutes the entire mass of iron becomes steel. It is then 'balled up' and hammered beneath a heavy trip-hammer, and is then ready to be rolled into rails, or used for any of the purposes of steel. Dr. FIELDS claims that it can be used for the manufacture of fine cutlery. In the manufacture of steel, two-thirds of old cast-iron and one-third of pig iron can be used, while in the manufacture of Bessemer steel, no old cast-iron can be used, but pig iron alone. Another advantage which is claimed for FIELDS' steel, is that it can be firmly welded to ordinary wrought-iron, while Bessemer steel cannot. Yesterday an ordinary iron rail was capped with FIELDS' steel, by welding, and the point where the iron and steel met was barely distinguishable. A rail made of iron by FIELDS' process was then capped with FIELDS' steel, and another rail was made of several pieces of FIELDS' steel, heated and rolled together, or 'piled,' as is the common expression. This morning a number of gentlemen were present, when a solid bloom of steel, weighing four hundred and twenty pounds, which Mr. FIELDS made at the iron works yesterday, in an ordinary puddling furnace, by his process, was rolled into a rail, to exhibit its adaptation to the manufacture of rails. The bloom was first heated, and then passed through the rollers. It fully satisfied the expectation of all present. The rail was cut into pieces, and many of the gentlemen secured fragments for examination.

"The steel and iron manufactured by Dr. FIELDS have been subjected to the severest tests. A large ball of the steel was taken directly from the puddling furnace to one of BURDEN'S rotary squeezers, and did not break in the least. Iron is tougher than steel, and iron which can stand the test of BURDEN'S squeezer is generally considered very tough, and the squeezer is considered an unusual test for steel. A piece of Dr. FIELDS' steel, several inches wide and about one inch and a half thick, was cut around to the depth of about three-eighths of an inch. It then required one hundred and three blows with a heavy sledge hammer to break off the piece at the point where it had been cut. This was considered an unusual evidence of its toughness and strength. Dr. FIELDS exhibited to us a small piece of his steel which had been reheated and thus refined. We applied it to a pane of glass, and found that it cut the same with the facility of a diamond. A small bar of Dr. FIELDS' wrought iron was bent in twain and the fibre of the iron exhibited. It is very close grained, and has great strength and apparent tenacity.

Dr. FIELDS will no doubt reap an immense fortune from his simple discovery. The ingredients of the powders which he uses he keeps a profound secret; refuses to tell the color of the powder, its weight, or, in fact, anything beyond the mere mention that it is a powder. To convert about four hundred pounds of pig iron into wrought iron, he uses a small package of apparently a pound or two in weight; to convert a like quantity of wrought iron into steel, he uses a small package. The powder is securely wrapped in papers, and he permits none even to glance at it. Dr. FIELDS states that he would not sell the secret of its manufacture for $1,000,000. While at the late Industrial Fair held in New York, a Mr. CHURCHILL, of London, proposed to purchase the right of manufacture and use the powder in America and England. But Dr. FIELDS refused a munificent offer, and stated that he did not wish an English capitalist to control the American market in the matter. Judge S. C. FIELD, of Chicago, has purchased a half interest to use the new process in several States, for the sum of $265,000. JAMES ROBERTS, an iron maker of Burlington, N. J., has purchased territory in Pennsylvania to the amount of $118,000, and the State of Alabama has been sold to JAMES MCCALL and a Mr. REED, of New York, for $10,000. The latter parties have evidently secured a big bargain, and we rather think they caught the doctor napping."

## MINING COMPANIES AND STOCK QUOTATIONS.

| GOLD AND SILVER COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| Alameda Silver | | A. Queran, 108 Wall st | $2,000,000 | $10 00 | | |
| Ada Elmore | South Boise, Idaho | | | | | |
| American Flag | Nevada District, Col | P. P. Fullerton, 71 B'way | 600,000 | 10 00 | 10 | 40 |
| Atlantic and Pacific | Humboldt Co., Nevada | | | | | |
| Bates and Baxter | Colorado | | | 50 00 | | |
| Benton | Colorado | W. F. Drake, 15 Broad | 500,000 | 5 00 | 12 | 14 |
| Briggs | Colorado | J. P. Davies, 19 Cliff | 1,000,000 | 100 00 | | |
| Black Hawk | Colorado | C.T. Whittington, 48 Broad | 2,500,000 | 100 00 | | |
| Bobtail | Colorado | J. Stanton, Jr., 25 Nassau | 1,000,000 | | | |
| Bullion Consolid'ed Gold | Colorado | | | | | |
| Burroughs Gold | Colorado | | | | | |
| Church Union Gold | California | | | | | |
| Consolidated Gregory | Colorado | | | | 1 85 | 2 00 |
| Combination Silver | Nevada | | | 100 00 | 1 50 | |
| Columbia Silver | Austin, Nevada | J. M. Brown, 155 B'way | 5,000,000 | | | |
| Commercial Silver | | J. E. Smith, 26 Pine | 3,000,000 | | | |
| Corydon | Gilpin Co., Colorado | J. Samuels, 40 B'way | 500,000 | | | |
| Downieville | Colorado | | 2,500,000 | 25 00 | | |
| Eagle Gold | Gold Dirt Dist., Col | J. P. Davies, 19 Cliff | 300,000 | 1 00 | | |
| Empire Gold and Silver | BodieBluff, MonoCo. Cal | H. K. Gates, 70 B'way | 1,000,000 | | | |
| Edgehill | | A. Fullerton, 71 B'way | 10,000,000 | | | |
| Esperanza Silver | | Ezra Clark, Jr., 13 William | 400,000 | | | |
| Fisk Gold | | H. Johnson, 195 Fulton | 500,000 | | | |
| Forest Queen | | E. B. Beet, 62 B'way | 1,000,000 | | | |
| Golconda Gold | Sherbrooke, C. E. | H. Adams, 71 Broadway | 2,000,000 | | | |
| Gregory | Colorado | | 1,250,000 | | | |
| Gunnell Gold | Colorado | J. H. Rolston, 80 B'way | 1,000,000 | 50 00 | | |
| Gunnell Central | Colorado | C. B. Bostwick, 16 B'way | 3,060,000 | 10 00 | | |
| Gold Rock | | R. M. Lockwood, 93 Wall | 400,000 | | | |
| Grass Valley | | | | | | |
| International Silver | | J. W. Brazier, 26 Pine | 600,000 | | 20 | 23 |
| Hope Gold | Colorado | | 5,000,000 | | | 10 |
| Holman | | | 2,000,000 | 25 00 | | 10 |
| Kipp & Buell | Colorado | | 300,000 | | | |
| Knickerbocker Gold | | J. H. Rolston, 80 B'way | 200,000 | 100 00 | | |
| La Crosse Gold | Nevada Dist., Col | P. P. Fullerton, 71 B'way | 1,000,000 | | 14 | 17 |
| Lander Hill T. & S | Nevada | M.L. Catherwood, 74 B'way | 1,000,000 | | | |
| Lewis Gold | Georgia | | 1,000,000 | | | |
| Liberty Gold | | | | | | |
| Manhattan Silver | Nevada | M. L. Ogden | 400,000 | | 2 | 4 |
| Maraposa common | California | Jas. H. Ferdon, 34 Wall | 12,000,000 | | 8 | 9 |
| Mariposa preferred | California | do. do. | | | 16½ | 17½ |
| Montana Gold | | G. De Cordova | 400,000 | | | |
| Montana M. L. & M. Co. | Montana | A. M. Hoyt, 22 William | 250,000 | | | |
| Montrose | Clear Creek Co., Cal | W. W. Perkins, 71 B'way | 1,000,000 | | | |
| New York Silver | Nevada | Thos. Sproull, 78 B'way | 1,500,000 | | | |
| New York and Austin | Nevada | E. R. Siccomb, 70 Wall | 500,000 | | | |
| New York and Owyhee | Owyhee Co., Idaho | | 1,000,000 | | | |
| New York and Eldorado | | G. H. Munroe, 10 Wall | 2,000,000 | | | |
| N. Y. & Montana M. & D. | Montana | F. A. Chapman, 20 Nassau | 1,250,000 | | | |
| N. Y. & Silver Peach | Nevada | R. C. Root, 74 B'way | 2,000,000 | | | |
| N. Y. & Utah P. & M | | W. H. Mailler, 108 Wall | | | | |
| Ophir Gold | Comstock Lode, Nev | L. C. Warner, 70 B'way | 625,000 | | | |
| Owyhee Gold | | W. H. Smith, 43 Ex. Place | 1,700,000 | | | |
| Pahranagat Central | Nevada | J. E. Smith, 25 Pine | 6,000,000 | | | |
| Quartz Hill Gold | | F. Bernard | 2,500,000 | | 70 | 75 |
| Reese River Consol'd | Nevada | W. B. Ogden | 6,000,000 | | 67 | 69 |
| Rocky Mountain | Colorado | S. M. Pond, 70 B'way | 500,000 | 10 00 | 5 | 7 |
| Rollins Gold | | Thos. Bond, 132 B'way | 600,000 | | | |
| Sensenderfer | Colorado | H. A. Shewill, 19 Broad | 1,000,000 | | 1 00 | |
| Silver Bend | | F. W. Macy, 20 Nassau | 1,500,000 | | | |
| Silver Mt. Silver | | H. A. Moen, 71 B'way | 1,000,000 | | | |
| Silver Peak & R. M | Nevada | W. B. Ogden, 52 Wall | 5,000,000 | | | |
| Smith & Parmelee | Colorado | W. H. Hollister, 6 Broad | 2,500,000 | 20 00 | 1 95 | 2 00 |
| Social & Steptoe Con | | T. H. O'Connor, 24 Nassau | 450,000 | | | |
| Standard Gold | | C. B. Bostwick, 169 B'way | 500,000 | | | |
| Symonds Forks | | | | | | |
| Twin River Silver | Nevada | J. F. R. Hadden, 20 Nassau | 800,000 | 100 00 | | |
| Texas Gold | Colorado | | 500,000 | 10 00 | | |
| Union Gold | Colorado | F. A. Potts, 110 B'way | 1,200,000 | | | |
| Wash. Mill & Silver | Nevada | W. W. Perkins, 71 B'way | 300,000 | | | |
| Wauba Yuma | Arizona | J. W. Silsby, 36 Pine | 6,000,000 | | | |

| COAL AND IRON COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| American Coal Co | | M. A. Myers, 119 B'way | $1,500,000 | $25 00 | | |
| Ashburton Coal Co | | J. T. Rollins, 41 Pine | 2,500,000 | | | |
| Block House Coal | | D. B. Keeler, Jr., 43 Pine | 1,000,000 | | | |
| Brewster Iron | | H. Robison, 165 B'way | 150,000 | | | |
| Broad Top Coal & Iron Co | Pennsylvania | B. Love | 2,000,000 | | | |
| Cameron Coal Co | | J. A. Simpson, 40 B'way | 2,500,000 | | | |
| Carbon Hill Coal Co | | J. Silsby, 36 Pine | 1,000,000 | | | |
| Central Coal | | F. P. White, 111 B'way | 2,000,000 | 100 00 | | |
| Clifton Iron Co | | P. H. Riordan, 34 Pine | 1,250,000 | | | |
| Columbia Iron | | E. D. Webb, 77 Cedar | 1,000,000 | | | |
| Consolidation Coal | Maryland | J. S. Mackie, 71 B'way | 5,000,000 | | | |
| Crawford Coal | | E. Clapp, Prest, 137 B'way | 1,000,000 | | | |
| Cumberland C. & I. Co | | E. Kisean, 90 B'way | 5,000,000 | | 27½ | 27¾ |
| Derby Coal Co | | W. S. Davison, 11 Broad | | | | |
| Dover Coal and Iron Co | | L. Chase, 88 Wall | | | | |
| Del. & Hudson Canal Co | | | 10,000,000 | 100 00 | | |
| Ebervale Coal | | G.L. Stout, Treas., 111 Br'y | 500,000 | | | |
| Fall River Bituminous | | D. T. Blauvelt, 43 Pine | 1,000,000 | | | |
| Farrar Coal | | C. H. Jones, 43 Pine | 250,000 | | | |
| Fisher Iron Co | | M. Ellis, 19 William | 100,000 | | | |
| Hamp're & Balt. Coal | | S. M. Pond, 70 B'way | 500,000 | | | |
| Iron Cliffs Co | | G. J. Canda, 52 Wall | 1,000,000 | | | |
| Jackson Iron | | G. P. Loyd, 119 B'way | 300,000 | | | |
| Kemble Coal & I. Co | | R. A. Wight, 26 Ex. Place | 300,000 | | | |
| Keokuk Coal | | J. F. Franklin, 112 B'way | 100,000 | | | |
| Lackawanna I. & C | Pennsylvania | E. C. Lynde, 52 Wall | 1,200,000 | | | |
| Lewis Run C. & I. Co | | C. A. Sanborn, 80 B'way | 750,000 | | | |
| Lykens Val. Coal Co | | F. A. Platt, 13 William | 800,000 | | | |
| McKean Co. Bit. Coal Co | | J. H. Rolston, 80 B'way | 1,500,000 | | | |
| Lehigh & Susquehanna | | | | | | |
| Mahanoy | | | 400,000 | 100 00 | | |
| McNeal C. & I. Co | | C. C. Godwin, 71 B'way | 500,000 | | | |
| Mount Riga Iron | | G. M. Newton, 42 Cedar | 300,000 | | | |
| New Boston Coal | | C. H. Ogden, 55 B'way | 2,000,000 | | | |
| N. Y. Con. C. & I. Co | | A. T. Levine, 16 Wall | | | | |
| N. Y. & Lehigh Coal | | T. Simpson, 111 B'way | 150,000 | | | |
| Pacific Coal Co | | G. Wrighton, 34 Wall | | | | |
| Peekskill Iron Co | | W. Murdock, 7 Nassau | | | | |
| Pennsylvania Coal Co | | C. H. Mead, 111 B'way | 3,200,000 | 50 00 | | |
| Richmond Iron Co | | C. H. Smith, 165 B'way | 1,000,000 | | | |
| Scotia Coal Co | | I. N. Soper, 42 B'way | 2,500,000 | | | |
| Spring Mt. Coal | | C. Runyon, 111 B'way | 1,250,000 | | | |
| Springfield & D'p Run C. | | E. D. Webb, 77 Cedar | 600,000 | | | |
| Stout Coal Co | | G. S. Comstock, 111 B'way | 500,000 | | | |
| Susquehanna & Wyoming | | E. Potter, 40 B'way | 1,000,000 | | | |
| Tannerdale Coal | | I. T. Ludlaw, 71 B'way | 250,000 | | | |
| Wash. Mutual Coal | | M. C. Baker, 117 B'way | 420,000 | | | |
| West Point Iron Co | | R. C. Brock, 110 B'way | 500,000 | | | |
| Wilkesbarre C. & I. Co | | W. H. Tillinghast, 80 Br'y | 3,400,000 | | | |
| Wyoming Val. Coal Co | | E. Potter, 40 B'way | 1,000,000 | | | |

| COPPER AND LEAD COMPANIES. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED |
|---|---|---|---|---|---|---|
| Anita Copper | California | J. A. Ferguson, 8 Wall | | | | |
| Corinth Copper | Corinth, Vermont | S. H. Howard, 191 B'way | $500,000 | 25 00 | | |
| Davidson Copper | | | | | 3 | 25 |
| Eagle Harbor Copper | Michigan | W. H. Smith, 43 Ex. Place | 500,000 | 25 00 | | |
| Evergreen Bluff Copper | Michigan | F. W. Caper, 44 Ex. Place | 500,000 | 25 00 | | |
| Globe Copper | | R. K. Rickard, 19 Nassau | 200,000 | | | |
| Grand Portage Copper Co | | A. S. Kellogg, 22 Pine | 500,000 | | | |
| Gaymard Lead | | Samuel Verpor, 38 Pine | | | | |
| Hilton Copper | | W. H. Smith, 43 Ex. Place | 500,000 | | | 7 |
| Hope Copper | | J. W. Davis, 19 Nassau | 500,000 | | | |
| Hudson River Copper | New York | T. Clarkson, 22 William | 1,500,000 | | | |
| Indiana Copper Co | | J. M. Mills, 25 Nassau | 500,000 | | | |
| Isle Royale Copper | Michigan | F. W. Caper, 44 Ex. Place | 1,000,000 | | | |
| Keweenaw Copper | Michigan | F. W. Caper, 44 Ex. Place | 500,000 | | | |
| Lake Superi'r Silver Lead | Michigan | A. S. Kellogg, 22 Pine | 1,000,000 | | | |
| Omiga Copper | Michigan | S. Cooper, 7 Pine | 500,000 | | | |
| Ridge Copper | Michigan | J. L. Gardiner, Jr., 43 Ex. P | 500,000 | | | |
| Rockland Copper | Michigan | A. Fullerton, 71 B'way | 500,000 | | | |
| St. Joseph Lead | Michigan | J. W. Jones, 6 Broad st | 1,000,000 | | | |
| St. Marguret Copper | | E. P. Sutton, 43 Pine | 250,000 | | | |
| Schoolcraft Copper | | R. Walsh, 22 William | 500,000 | | | |
| Superior Copper | Michigan | A. Fullerton, 71 B'way | 500,000 | | | |
| Union Copper | | A. S. Kellogg, 22 Pine | 500,000 | | | |
| Vermont Copper | Vermont | J. C. Fly, 191 B'way | 500,000 | | | |
| Wallkill Lead, asst | | S. M. Pond, 70 B'way | | | 4 | 5 |

| MISCELLANEOUS. | SITUATION OF MINE. | SECRETARY AND PLACE OF BUSINESS. | CAPITAL. | PAR VALUE. | OFF'R'D. | ASKED. |
|---|---|---|---|---|---|---|
| American Zinc Co | | W. E. Lawton, 19 Cliff | $1,000,000 | | | |
| Bigelow Blue Stone Co | | H. Bogardus, 14 Pine | | | | |
| Quicksilver | | | | | 14⅞ | 15 |
| Covill B. L. M. & M'f. Co | | C. R. Bostwick, 302 Pearl | 250,000 | | | |
| Manhattan Marble | | H. K. Gates, 70 B'way | 300,000 | | | |
| N. Jersey Zinc Co | New Jersey | A. H. Farlin, 61 Maiden L'e | 1,500,000 | | | |

### Steamship Coal.

A PARLIAMENTARY RETURN, recently issued, gives an account, for the six months ending June 30, 1869, of the quantity of coal consumed on board each ship in the Royal Navy, according to the particulars supplied half-yearly for the information of the Lords of the Admiralty. This document shows that Her Majesty's ships take in coal at ports in all four quarters of the globe, and burn in their furnaces nearly every description of anthracite or bituminous product of mines. The commanding officers of every ship have to report, in conjunction with the chief engineers, on the quality of the coal used in generating steam, and to state whether it is good and fit for the service, or otherwise. In the official paper now before us, there are reports from 131 ships; we have opinions, therefore, on some three hundred to four hundred different kinds of coal. The publication of these steam shipping reports will, no doubt, afford food for controversy; the statements therein are likely to be reproduced by mine-owners, coal factors, merchants, and agents, in favor of or against certain qualities of coal. Every colliery proprietor whose coal has been depreciated by his official digest will feel aggrieved, as it is obvious that the reports will stand as certificates, and serve for reference. One fact is brought out very clearly in the return, that is, the loss of heating power is proportioned to the exposure of the coal to atmospheric influence. We have often commented on this peculiar feature, and shown that, in trials of relative speed, no positive result could be secured unless the fuel consumed on every occasion was raised from the same seam of coal, and also at one time. We have dwelt upon the fact that decomposition commences the moment coal comes into contact with air, and that to secure its steam generating properties it should be kept under cover. This is an important consideration for large consumers of coal, as the price is the same whether the fuel be efficient or not. A loss in heating power of twenty-five per cent. means that it takes one hundred pounds of coal to do the work of seventy-five. This, in stowage and economy of working expenses, must tell immensely upon the revenue of a Steamship Company.

We may quote from this Parliamentary Return to further establish what we have said. For instance, the Welsh coal, called Powell's Duffiryn, appears to have been rather extensively consumed by the ships mentioned in the report, and spoken of, in most cases, as good and fit for the service. We find, however, that the Ariadne took in six hundred and fifteen tons of this coal at Alexandria, and, though to all appearance good, it had been exposed to the atmosphere and become powerless. The Barracouta was furnished with fifty-two tons of Welsh coal, (the name of the mine unknown to contractor,) which had "perished by age and exposure," and produced twenty per cent. of ash. The Endymion had one hundred and seven tons of Ebbw Vale, at Gibraltar, which burnt very fast and were decayed. This old or new consumption may account for coal being condemned as unfit for steam purposes in one ship, and in another being highly praised. The ventilation of engine-rooms and form of furnaces must have, as a matter of course, much to do with coal burning. We may exemplify this by further extracts from the Admiralty compilation. The Terrible coaled at Davenport, with about four hundred tons, composed of Welsh and Hartley. There was no other waste than two per cent. of clinker; the ashes were burnt and the smoke was very light. The Salamis, with the Welsh coals, supplied to her at Hong Kong, made twenty-seven, twenty-eight and thirty per cent. of clinker and ash. Coal would seem to be burned with different results. Take, for instance, Nixon's Navigation, about the best applied in marine furnaces. On board the Vivid, at Woolwich, this coal left four per cent. of ash and three per cent. of clinker. The Boxer had forty-one tons supplied to her at Rio de Janeiro, and they gave 12.4 per cent. of ash and .009 per cent. of clinker. The Magæra had one hundred and sixty tons of the same coal at Rio de Janeiro, which left only nine per cent. of ash and clinker; and on one hundred and twenty tons put on board the Oberon there, by the contractor, the waste was only seven per cent., together tallying exactly with the consumption in the Boxer. Nixon's Navigation and Aberdare, mixed, furnished to the Caradoc at Patras, was pronounced as "fair," but left 19.5 per cent. of waste. Mixtures of Welsh with North-country coal, in various portions, have been tried with different results. Taking the Welsh as a whole, it gives considerable more clinker than North-country coals, but less dense smoke. If, therefore, the smoke could be consumed—and we believe it can—there would perhaps be a better demand for the last named coals. The tugs of Mr. WATKINS are said not to throw out any smoke, and if this can be effected with one hundred and fifty or two hundred horse-power engines on the Thames, and with a saving of fuel, we do not see why a like efficiency cannot be attained in the navy. North-country coal is objected to by captains of her Majesty's ships, because it makes a black smoke, and begrims the masts and sails, besides denoting the position of a ship of war to an enemy. Welsh, therefore, unless in special cases, will be preferred to North-country, though we find by the reports here commented upon, that many of the former emit smoke more or less black and dense.

In the report from the Psyche on consumption of one hundred and ninety-five tons of Wayne's Merthyr, it is said that, to burn well in that ship, they require it to be mixed with north-country produce, and a similar suggestion is made on Neville's Llanelly, burnt on board the Wizard. In the Aspall a large amount of sulphur was present, though the coal generated steam kindly, and left less than four per cent. of waste. The Galatea coaled at Adelaide with five hundred and five tons of Newcastle (New South Wales), which were good, but, in consequence of the volume of smoke they gave off, choked the tubes of the boilers. The ash and clinker were ten per cent. At Sydney the Galatea took on board two hundred and twenty eight tons of Illawara (N.S.W.) coal; these are reported as generating steam well, being economical, and yielding only seven per cent. of ash, with no clinkers. There appears to be a very great difference in Welsh coals. Nautmelyn Merthyr, tried on board the Magnet, are said to have been uneven in quality, the good parts generating steam quickly and producing good results, while the bad parts fused the fire bars, rendering them quite useless. In one case, after steaming twelve hours, seventy bars were fused together in lots of five, six, and seven, thereby destroying the means of perfect combustion. The Zealous was supplied with two hundred and twenty-two tons of Nanaimo coal at Esquimalt, which were found fair and fit for the service, leaving eighteen per cent. of ash, five per cent. of clinker, with a great quantity of smoke. The same ship had sixty tons of Philadelphia anthracite, which burned well, gave ten per cent. of ash, with no clinkers, and were smokeless. The East India transport steam troopships seem to be the largest consumers of coal. The Serapis, during the six months, took in 3,994 tons, and the three other ships about equal quantities. These must be expensive ships to work and maintain, and though they take large numbers of officers, soldiers, and stores, it is very questionable whether the Government have saved anything by their employment. Contract vessels, we suspect, would prove much cheaper to the State; and, when the Suez Canal is opened, and ships of lesser draught can proceed through, without transhipment, economy will demur to the wisdom of continuing them in the service. Whilst this return is replete with information to steamship owners, they should remember that all furnaces are not of the same construction. Allowances in this respect should be made in estimating the value of coal. Above all, it is necessary to learn when a given coal left the pit's mouth, and how it was protected when in store.—*Mitchell's Maritime Register.*

### The Ransome Process.

ALMOST every one is familiar with the ordinary process by which Mr. FREDERICK RANSOME manufactures artificial stone, and knows how the sand, mixed with silicate of soda, is treated then with chloride of calcium, with the result of their mutual decomposition and reformation as silicate of lime and chloride of sodium, the former living as an indestructible bond throughout the stone, the latter soluble and easily removed. The process, beautiful and simple, can be seen any day in extensive application at the works at East Greenwich. The sand, after being dried, is worked up in a mill with the soluble silicate brewed from caustic soda and flints, the latter being dissolved by the former, and evaporated down to a specific gravity of 1.700. The plastic mass thus produced is obedient to the will of the moulder, and can be manipulated into any form, from a cube to elaborate screens, such as those decorating the India Office; from a grind-stone to an exquisitely-chiselled fountain, like that recently erected in the public gardens at Hong Kong. The mass so prepared is then saturated with chloride of calcium, applied either simply by immersion, or assisted by the action of an air-pump, in either process the solution being gradually heated to a temperature of 212 degrees, Fahrenheit. Mr. RANSOME has recently made some further important improvements, which promise great results. These consist, first, in submitting the moulded mass to the indurating action of the chloride solution at a higher temperature in closed chambers connected with a steam boiler. When this has been carried on for a sufficient length of time, by opening a cock the solution is forced by steam pressure into a separate chamber, leaving the stone to cool gradually in partial vacuo, by which all dangers of cracking is avoided—a casualty which is liable to happen when large masses are exposed to rapid extremes of temperature in the open air.

The next feature in these improvements lies in the ingenious method adopted by the inventor for extracting the soluble salts of calcium and sodium from the body of the stone, which is effected in the same closed chamber by the admission of steam (or steam and water alternately), which, as it condenses and becomes saturated with the salts referred to, is returned into the boiler, where the steam is generated, and the chloride of calcium is again made available for future operations, thus obviating the serious loss incurred by washing the stone in the way hitherto adopted.

It is gratifying to learn that the manufacture of this stone is being adopted even in most distant parts of the globe. We have already, in previous notices, informed our readers that manufactories for its production have been established in India, America, Australia, Belgium, Denmark, and Sweden. But little actual progress has, however, been made in the practical introduction of the RANSOME process in the United States; it is true that the patent rights for that country were advantageously disposed of some years since, and that the proprietor in America has made capital by the sale of licenses; but ignorance or indifference on the part of the original purchaser, prevented his licensees from developing a large and most lucrative branch of industry. This being the case, it is satisfactory to find that one of the would-be manufacturers in the United States has taken the initiative, and is endeavoring to redeem the time lost and the capital expended in useless experiments. The proprietors for the patent right for the State of California have established large works in San Francisco, under the title of the Pacific Stone Company, for the production of artificial stone, and, but for the slight drawback of being in ignorance of the practical details of the process, would probably have developed an extensive business. Being unable to obtain the necessary information from the American proprietor, and tired of working in the dark, they have at last adopted the most satisfactory and common-sense course of coming from California to Greenwich to learn the whole course of the manufacture at the fountain head. To this end, the managing director, and principal shareholder in the Pacific Stone Company, Dr. W. MAY, has recently arrived from California, and is rapidly acquiring the mysteries of artificial stone manufacture from Mr. FREDERICK RANSOME, by whom every facility is offered for the benefit of American licensees. We mention this because it is a matter much to be regretted that for so long a time the vastly important Ransome process should have remained almost a dead letter in the States, so far as real utility is concerned; the American proprietor having apparently devoted his attention to making money rather than stone, from his purchased patent right. This is, of course, at an end now, and the manufacture under this patent in America will be so much greater than it is in England, as the demand for the production is proportionately increased.—*Engineering.*

### Important Discoveries in the Northwest.

DURING the summer just closed, good work appears to have been done by the geological survey in the Lake Superior region. Professor BELL's party have all returned to their winter quarters after having experienced many of the hardships and privations incident to the life of the first explorers in the distant wilderness. We understand that the result of the expedition includes a complete topographical and geological survey of Lake Nipigon, and an exploration of much of the surrounding country. This lake, it appears, will rank in point of size with the other great lakes of the St. Lawrence, forming the sixth and last in the chain. Professor BELL has not yet been able to map the whole of this extensive survey, but thinks the area of Lake Nipigon will be found to exceed that of Lake Ontario or even Erie—some five hundred miles or more of coast line having been traversed. This great Lake is drained by the Nipigon river or upward continuation of the St. Lawrence beyond Lake Superior, which is described as a very clear water stream, about thirty miles in length. Upward of a dozen rivers of considerable size are reported to empty into Lake Nipigon from all sides. We understand that one of the most singular features in the geography of his beautiful lake, is the immense quantity of islands which are scattered throughout its whole extent, and present a great variety in size, form, and elevation. It appears that geological discoveries of a highly interesting and important nature have been made, and that, contrary to common belief, a large extent of table land, with deep and fertile soil, exists in the Nipigon country. Professor BELL had received instructions in addition to his geological explorations, to obtain as much information as possible in regard to a route to our great western territory, and his discoveries in this direction are, perhaps, not the least important of the results of the expedition. If we are not mistaken, he has found that this country, so far from being a difficult one, offers great facilities for railroad construction. Further, he has, we believe, ascertained that the elevation of Lake Nipigon above Lake Superior is very moderate, and consequently this lake may be found useful for the purposes of navigation in the desired direction. It will, of course, require considerable time to elaborate for publication all the geological data obtained upon this survey, but it is to be hoped that a special report on the engineering capabilities of the country will be obtained as soon as possible, since it is so desirable to have all the information available before finally adopting any route.—*Toronto Globe.*

### The Howland Rotary Battery.

NEW YORK, January 12th, 1870.

TO THE EDITOR—SIR: Please allow us to correct an error that occurred in your issue of last week, in an article in reference to the Howland Rotary Battery, which you illustrated. It was stated that the eight-stamp rotary battery, running one hundred drops per minute, crushed twelve to sixteen tons per day of twenty-four hours, and it was not stated that the mill works the ore dry. Now the facts are these: The Howland Rotary Battery of eight stamps, six hundred pounds weight, running one hundred drops per minute, *wet-crushing*, will crush twenty to twenty-five tons per day. The price of the twelve-stamp rotary battery of six hundred pounds stamps, in San Francisco, is $2,800, *gold*, and not currency, as many might infer by the fact not being stated. We manufacture the twelve-stamp rotary battery here for $3,000, currency. The mill is complete in itself, requiring no wood frame, and capable of crushing thirty to forty tons of ore per day. There was also a typographical error in saying ease of "suction." You doubtless meant to say, ease of *action*. If you will insert the above correction in your next issue, you will oblige,

Yours, respectfully, MOREY & SPERRY.

### A Medal of Palladium-Hydrogenium.

AT the meeting of the "*Deutsche Chemische Gesellschaft*," at Berlin, October 11, the President, Professor A. W. HOFMANN, exhibited a medal, struck in palladium-hydrogenium, which was handed for him to Mr. MAGNUS, then at London, by GRAHAM, a few days before his death. The medal has the size of a two-groschen piece (about that of a two-cent piece). On one side it bears the likeness of Queen VICTORIA; on the other, the name GRAHAM, with the circumscription "Palladium-hydrogenium—1869." A note accompanying the medal states that it contains 147 cubic centimetres, or 900 times its own volume of hydrogen. Since the medal is nearly one millimeter thick there is condensed therein a hydrogen column, nearly one meter in height.

### The New Excitement in Montana.

WE this week devote considerable space to more recent reports from the newly-discovered gold diggings at Cedar Creek, Montana. The wildest excitement prevails throughout the territory, in consequence of the rich "strikes" reported by "reliable miners" and the Press, and thousands are flocking from all quarters to the new Eldorado. It is to be hoped that half who go there will be richly rewarded.

# THE ENGINEERING AND MINING JOURNAL.


CONTENTS FOR THIS WEEK.

[*Illustrated Articles are marked with an asterisk.*]


| | | | |
|---|---|---|---|
| *The Rider Vertical Engine | 33 | Mining Companies and Stock Quotations | 39 |
| The Planet Saturn | 33 | Improved Iron and Steel Process | 39 |
| American Mining and Metallurgy from a Foreign Standpoint | 34 | Steamship Coal | 40 |
| The United States Mining Law | 35 | The Ransome Process | 40 |
| Some Occurrences of Native Copper at Keweenaw Point, Lake Superior | 36 | Important Discoveries in the Northwest | 40 |
| Wooden Railways | 36 | The Howland Rotary Process | 40 |
| Mining under the sea | 36 | EDITORIALS: | |
| MINING SUMMARY | 36 | Mr. Dubois on Weights and Coins | 41 |
| BUSINESS AND PERSONAL | 37 | The Ichthyosaurus-Lied | 41 |
| MARKET REVIEW | 37 | Professor Stapff's Letters | 41 |
| | | Hard to Suit | 41 |



ROSSITER W. RAYMOND, Ph. D., Editor,

**PUBLISHERS' ANNOUNCEMENT.**

*THE ENGINEERING AND MINING JOURNAL is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.*

SUBSCRIPTION—**$4** *per annum in advance;* **$2 25** *or Six Months.*

ADVERTISEMENTS.—*The rates are as follows: Inside pages,* **25** *cents per line each insertion; the outside or last page,* **40** *cents per line. Payment required in advance.*

NEWS-DEALERS *will be supplied through the agency of the* AMERICAN NEWS COMPANY, *No.* 121 *Nassau street, New York City.*

COMMUNICATIONS *of all kinds should be addressed to the Publishers. The safest method of transmitting moneys is by checks, or Post-office orders, made payable to their order.*

*Correspondence and general communications of a character suited to the objects of* THE ENGINEERING AND MINING JOURNAL *will always be welcome.*

*The Postage on* THE ENGINEERING AND MINING JOURNAL *is twelve cents a year, payable quarterly, in advance, at the office where received.*

GEO. E CUMMINGS *is our Agent at Philadelphia. Office,* 429 *Chestnut street.*

**WESTERN & COMPANY,**
**Publishers and Proprietors,**
37 PARK ROW,
P. O. Box, 5969. NEW YORK CITY.


### Publishers' Notice.

Bound copies of Volume VIII., containing THE ENGINEERING AND MINING JOURNAL from July to December, 1869, are for sale at this office, until further notice, at $4 per copy. The price, as our readers are aware, is usually advanced as the copies grow scarcer; and we would therefore advise all who intend to keep a complete set of the JOURNAL, to send in their orders at once.

WESTERN AND COMPANY.

### Mr. Du Bois on Weights and Coins.

A SMALL *brochure* on these topics, by WILLIAM E. DU BOIS, Esq., Assistant Assayer of the United States Mint at Philadelphia, made its appearance during the last autumn, and attracted some comment from the press—mainly in the way of indiscriminate praise, or mere recapitulation of its contents. A suitable discussion it does not seem to have received; and we have postponed for several months our remarks upon it, because we are inclined to favor one part of its suggestions very heartily, while we have felt from the outset that a little time would reveal, even to the author, the weakness of another part. We now propose to consider briefly the arguments and propositions of Mr. DU BOIS, with the respect due to his office and his acknowledged ability.

The first part of his treatise relates to a system of weights. Mr. DU BOIS objects to the French metrical system that it is no more exact or convenient than our own would be, with a slight change; that it does not allow of halving and quartering, but only of division by tenths; and that its nomenclature is very clumsy. We have repeatedly shown that the metrical weights and measures possess no exact relation to any natural standard. The meter is an erroneously measured fraction of a great circle; and, in spite of its pretensions, amounts in reality to nothing more than the length of a certain authorized metallic rod—like any other legal unit of measure. But the establishment of a relation to the diameter or circumference of the earth is a thing of purely fanciful value. There are many more exact methods of correting a standard of length than by geodetic measurements or calculations. So, after all, the meter is no worse for being based on a mistake. But the merit of the French system is that all the weights and measures employed have exact relations to the meter. The specific gravity of any substance represents, without further calculation, the weight in kilogrammes of a liter or cubic decimeter of that substance, or the weight in grammes of a cubic centimeter, or the weight in milligrams of a cubic millimeter. If large quantities are to be measured, the same figure represents the weight in milliers (or tonneaux or metrical tons) of one cubic meter. And as this metrical ton is equivalent to 2204.6 avoirdupois pounds, it is practically not far from our own long ton—quite as near it, in fact, as dealers are likely to come. This perfect correspondence of weights and measures is the great advantage of the French system over every other in use; and this is not to be attained, as we shall see, by the change Mr. DU BOIS proposes in our existing English weights. What he says about halving and quartering is true of all decimal notations; but the metrical weights can be as well halved and quartered as those which he proposes. Half a kilogramme is no harder to construct than half a pound. Still, we confess that the accepted units of the French scale are less convenient than ours. The kilogramme (a little over two pounds) is too large—or seems so to us; the gramme (15.432 grains) is too small. The milligramme, on the other hand, is a beautifully convenient unit for delicate determinations.

Mr. DU BOIS' charge against the French nomenclature is more obvious than profound. It is true that the House of Commons laughed at the picture of "a little girl, going into a shop, and asking for three decigrammes of candy;" and it is true, that "the easy error of asking for three decagrammes would give her a hundred times as much." But three decigrammes being only 4.5 grains, little girls are scarcely likely to ask for such a quantity; and three decagrammes, being a little over an ounce, is far more likely to be called for. But in fact, the gramme itself (being about a cent's worth) is likeliest of all to be on a child's lips! The result of actual practice with the metrical weights is the retention of the terms milligram, centigramme, gramme, kilogramme (shortened to kilo.) and tonneau or ton.

Mr. DU BOIS proposes that we discard the troy weights, and retain only the avoirdupois pound, adopting the short ton of two thousand pounds, and readjusting the ounce and the grain, so that there shall be ten ounces to the pound, instead of sixteen, and a thousand grains to the ounce, instead of four hundred and thirty-seven and a half. He would expect tradesmen to use halves, quarters and eighths of a pound, "just as we have half and quarter dollars, which, however, in figures, are .50 and .25."

To put this system in force, he proposes a law, enacting that, after a certain day, all weights used and reckoned in government offices shall be after this system, and the troy weights shall be discontinued; that all statements of weight between buyer and seller shall be in accordance with this law; and that the Bureau of Weights and Measures shall make, from its standard pound, avoirdupois sets of ounce and grain weights according to these provisions, to be supplied to the State governments as legal standards.

On the whole, we are inclined to approve these recommendations. The changes proposed are slight, and do not destroy existing standards, and there would be a decided gain in convenience of reckoning. But we cannot think with our author that they would open the way to reforms in measurement, or to a compact system of metrology. If we are to have such a system, it must be either by adopting the French plan with all its imperfections, or by adjusting our present weights to our present measures, (taking as unit of weight the weight of a cubic inch or cubic foot of water), or by reforming *first* our measures and then our weights. Mr. DU BOIS' plan would be good enough, so far as it goes; but it neither goes far, nor promises to go farther.

The tendency of the time is to the employment of the metrical weights for calculations, and the ordinary weights for trade. What will come of the co-existence of the two systems is not certain; but we have waited so long that it will do no harm to wait a little longer.

### The Ichthyosaurus-Lied.

THIS celebrated burlesque geological ballad has been long current in Germany; but we have never met with it in an English version. The impossibility of transferring to another language its quaint student-humor, to say nothing of its felicitous plays upon words, has long prevented us from any attempt at its translation. Why we have broken through so judicious a resolution, we can scarcely tell, even in this, the supreme moment of perpetration. We have no better excuse to offer than the desire of friends who have found pleasure in the specimens of foreign miners' songs which we have from time to time presented in our columns.

The Ballad of the Ichthyosaurus refers to the close of the Jurassic (or Liassic) period, and the beginning of the Cretaceous, and describes the sad forebodings of a venerable Saurian, who sees in the degeneracy of the times a sign of the coming cataclysm:

There's a rustling in the rushes,
There's a flashing in the sea,
There's a tearful Ichthyosaurus
Swims hither mournfully!

He weeps o'er the modern corruption,
Compared with the good old times,
And don't know what is the matter
With the Upper Jura limes!

The hoary old Plesiosaurus
Does nought but quaff and roar;
And the Pterodactylus lately
Flew drunk to his own front door!

The Iguanodon of the Period
Grows worse with every stratum;
He kisses the Ichthyosauresses
Whenever he can get at 'em!

I feel a catastrophe coming;
This epoch will soon be done,
And what will become of the Jura,
If such goings on go on?

The groaning Ichthyosaurus
Turns suddenly chalky pale;
He sighs from his steaming nostrils,
He writhes with his dying tail!

In that self-same hour and minute,
Died the whole Saurian stem—
The fossil-oil in their liquor
Soon put an end to them!

And the poet found their story
Which here he doth indite,
In the form of a petrified album-leaf
Upon a coprolite!

Among the many extraordinary liberties which we have felt obliged to take with the letter of the original, in order to preserve as far as possible its spirit and its flowing movement, the most violent is the substitution in the last stanza but one, of an entirely new (and poor) joke for the very neat, but untranslateable *jeu* of the German. The last two lines of the stanza are:

"Sie kamen zu tief in die Kreide;
Da war es natürlich vorbei."

The literal meaning is: "They got too deep in the chalk, and it was, of course, all up with them." The allusion is to the score chalked up by a landlord against some bibulous, but impecunious customer; and the notion that the Saurians ran up so large an account for drinks that the chalk required to mark their indebtedness smothered the whole race, and brought on the Cretaceous or chalk period, is so absurdly funny that it is a pity to sacrifice it.

The reader unfamiliar with the characters of the ballad will find much amusement in comparing what is said of them by the poet, with their forms as shown in palæontological textbooks, or in such restorations as those of Mr. WATERHOUSE HAWKINS. The Ichthyosaurus was a sort of crocodile, "only more so," and is naturally represented as weeping. The Plesiosaurus, with his tremendously long neck, must have got more fun out of guzzling than any toper before or since; and if he was not a habitual drunkard, he disregarded the indications of nature. The ordinary curse of self-indulgence is, that the pleasures of the gullet are extremely transitory, and likely to be succeeded by the pains of the stomach; but a creature with no end of gullet might very well afford to disregard the other part of his anatomy altogether. By the time one drink had made its way to regions where it might become troublesome, he could have forgotten all about it, and begun on another. As for the Pterodactylus, a mere look at his skeleton is enough to show that he would have the reputation of being drunk, even when he was sober; so what was the use of his flying in the face of the fashion of his time?

But nothing is in general more stupid than the efforts of a commentator to discover and define the humor of his author; and we spare the reader any further weariness.

### Professor Stapff's Letters.

TAKING advantage of the presence in this country of the eminent mining engineer and metallurgist, Professor F. STAPFF, late of the celebrated School of Mines at Fahlun, Sweden, we have engaged him to contribute to the columns of this journal a series of letters, embracing the notes of his observations in American mines and metallurgical establishments, the first of which we publish this week. Although Professor STAPFF modestly disclaims special acquaintance with iron-metallurgy, the facts and suggestions on that subject contained in this communication will be found quite practical and valuable; and give us reason to expect that his future remarks on the mining and reduction of other metals, which constitutes his special field, will possess the highest interest to Americans engaged in those pursuits.

We cannot forbear calling attention to the truly scientific and liberal spirit in which these communications are conceived. It is too commonly the case, that foreign experts feel called upon to condemn at once everything in this country which they were not accustomed to see at home. They appear to regard us as outside barbarians, who have everything to learn and nothing to teach. From these dogmatic, self-opinionated aristocrats, we cannot hope for much benefit. They have not even attained the elementary conception of the profession they follow, namely, that the principles of a science cannot change, while the applications of it cannot fail to vary with circumstances. Their procrustean criticism is of no use to any body. The educated expert, who adheres blindly to the constructions and methods he has studied in books or foreign lands, is not a whit superior to the ignorant workman by the "rule of thumb," who does what he is told, or what his fathers did: and, indeed, his blunders are likely to be costlier and more disastrous.

It is refreshing to find men of high attainments and experience cordially recognizing the progress already achieved in American metallurgical industry. When such men offer suggestions of improvement, we are inclined to listen to them, and to wish they might be induced to remain among us, and apply their superior knowledge, in this reasonable spirit, to the problems with which we have to deal.

As will be seen from an advertising card in this paper, Professor STAPFF has established himself for the present as a consulting engineer in St. Louis. We hope our Missouri friends will not fail to take the benefit of his experience, skill, and good sense.

### Hard to Suit.

THE Colorado *Central City Register*, after courteously correcting certain erroneous statements with regard to the United States Commissioner of Mining, continues as follows: "We are willing to concede the integrity of Mr. RAYMOND's motives in reporting Colorado, but cannot regard his first Report in any other light than damaging to us. Our mining resources need no favors at his hands, but we prefer entire silence to his defective and unfair notices. We trust that in his coming Report he will either do better than heretofore, or omit to make any mention of us. Justice to Colorado demands as much."

Mr. RAYMOND has never made any official Report whatever on Colorado. His only Report thus far published refers entirely to other States and Territories; and the only allusion to Colorado to be found in any official communication from his pen, so far as he can recollect, is wholly comprised in the following paragraph, from his recent letter to the Secretary of the Treasury:

"Colorado appears to me to have passed a turning-point in her history during the present year, and to be destined to advance, henceforth, with great rapidity towards wealth and power. The yield of the mines for 1869 is highly encouraging, especially in view of the fact that it is the product of steady industry, and not the first fruits of a speculative activity, which might be expected to die out again at an early day."

If the *Register* finds fault with this expression of the writer's sincere conviction, we should be glad to know the grounds of its criticism. Otherwise, we assure the *Register* that the "damaging first Report" which it "cannot regard in any other light," it may safely *dis*regard altogether, since it never had any existence.

The *Register* has evidently been seriously misinformed, or it has mistaken some other Report for Mr. RAYMOND's. We rely upon the fairness shown in its recent explanation, to ask the further favor of a complete correction of the error.

### The Howland Rotary Battery.

ATTENTION is directed to a communication in another column, from Messrs. MOREY & SPERRY, correcting certain statements made in our last issue, in regard to the Howland Rotary Battery. It appears that the effective results of this excellent machine are somewhat greater than we supposed. Certain other facts are ventilated by our correspondents, which our readers will do well to note.

## NOTICES.

**ADELBERG GOLD COMPANY.**—ANNUAL REPORT.—The amount of the capital stock of said Company is five hundred thousand ($500.000) dollars, par value, the whole of which has been paid in by the purchaser of mines and other property necessary for the business of the company. The debts of the company do not exceed three thousand ($3.000) dollars.

R. W. RAYMOND, President.
LORIN PALMER, Trustee.
A. H. SCOVILLE, "
Majority of Trustees.

NEW YORK, January 6th. 1870. } ss.
City and County of New York. }

Lorin Palmer, being duly sworn, deposes and says, that he is the Secretary of the Adelberg Gold Company, and that the foregoing statement is true to the best of his knowledge and belief.

W. G. LATHROP, Notary Public.
New York City and County.

**ANNUAL REPORT of the American METALLURGICAL COMPANY.**

This Company, in pursuance of the Statute, makes the following Report:

The amount of the capital stock of the company is five hundred thousand dollars ($500.000), which has been issued in payment of the patent rights of Charles A. Stetefeldt and A. F. Partz.

The Company is free from debt.

New York, January 1st. 1870.

D. R. STANFORD, President.
JAMES E. LYON,
L. SATTERLEE,
R. W. RAYMOND,
BENJ. F. DALTON. } Trustees.

City and County of New York, ss.:

R. W. Raymond, being duly sworn, says, that he is Secretary of the Company named in the above report, and that the facts stated in said report are true to the best of his knowlege and belief.

R. W. RAYMOND.

Sworn before me this 13th day of January, 1870.
WM. F. MCNAMARA, Notary Public.
New York City and County.

## MISCELLANEOUS.

**THE BALLARD FURNACE.**

IMPROVED DESULPHURIZING PROCESS FOR CRUSHED ORES, SLIMES AND TAILINGS.

Parties wanting a CHEAP, SIMPLE and EFFICIENT method of ore reduction, and one specially adapted to low grade ores, slimes and tailings, will find it to their advantage to carefully investigate the merits of this process.

For full information apply to MOREY & SPERRY, 95 Liberty street, New York, or to F. W. CROSBY, North Barrier, North Carolina. Dec.21-3m

TO THE WORKING CLASS.—We are now prepared to furnish all classes with constant employment at home, the whole of the time or for the spare moments. Business new, light and profitable. Persons of either sex easily earn from 50c. to $5 per evening, and a proportional sum by devoting their whole time to the business. Boys and girls earn nearly as much as men. That all who see this notice may send their address, and test the business, we make this unparalleled offer: To such as are not well satisfied, we will send $1 to pay for the trouble of writing. Full particulars, a valuable sample, which will do to commence work on, and a copy of *The People's Literary Companion*—one of the largest and best family newspapers published—all sent free by mail. Reader, if you want permanent, profitable work, address, E. C. ALLEN & CO., Augusta, Maine. Jan18:3m

## ENGINEERS.

**P. H. VAN DER WEYDE, M. D.,**

(Late Professor of the N. Y. Medical College, of Mechanics, etc., at the Cooper Institute, and of Industrial Science at the Girard College, Philadelphia.)

**Analytical & Consulting Chemist and Engineer.**

RESIDENCE, 73 Seventh Street.

Office ENGINEERING AND MINING JOURNAL, 37 Park Row, New York City. jan30tf

**R. P. ROTHWELL,**

MINING AND CIVIL ENGINEER AND METALLURGIST,

From the Imperial School of Mines, Paris, member of the Geological Society of France, etc,

*OFFICE, WILKESBARRE, PA.*

Having had a large practical experience in Europe and this country, is prepared to examine and report on all kinds of mineral property, superintend mines, and metallurgical works, assay ores, etc. 18-2-qp

**HAWKINS, HERTHEL & BURRAL,**

**Civil and Mechanical Engineers,**

BUILDERS OF

Herthel's Patent Truss, and other Iron Bridges, Roofs, and Turn-Tables. Also Howe's Patent Truss, and other Timber Bridges, Roofs, and Turn-Tables.

Corrugated Iron Doors, Shutters, and Iron Building Material generally. Contractors for Piling, Docking, and General Railroad Work.

July 20-1y SPRINGFIELD, MASS.

**A. D. BRIGGS & CO.,**

**Civil and Mechanical Engineers,**

BUILDERS OF

Tuesdell's Patent Truss Bridge, and other Iron Bridges, Roofs, and Turn-Tables. Also Howe's Patent Truss Bridge and Roof, and other Timber Bridges and Turn-Tables. Particular attention given to repairing all kinds of Bridges. All work warranted to give satisfaction. Plans, Estimates, and Specifications, upon application.

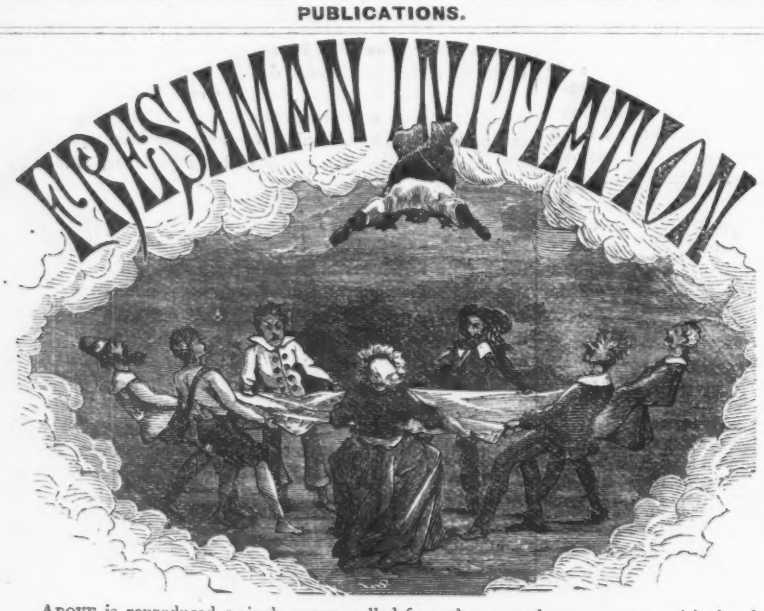
July 20-1y SPRINGFIELD, MASS.

**F. M. STAPFF, PH., D.**

(Late Professor at the Royal Swedish School of Mines.) Consulting Mining and Metallurgical Engineer, St. Louis (Mo.) 312 South Fifth street, 3d floor. jan 11-4t

**ADOLPH MEZGER, MINING AND METALLURGICAL ENGINEER,** for many years engaged in the practical management of mines and furnaces in Saxony, Russia, Austria, Mexico, etc., and thoroughly acquainted with the mining of Coal, Copper, Iron, Lead, etc., is prepared to give assistance and information in all branches of the profession, or would accept an engagement in a mining or smelting establishment. The highest references furnished. Address the office of the ENGINEERING AND MINING JOURNAL, 37 Park Row, New York. jan 11-tf

## PUBLICATIONS.




ABOVE is reproduced a single group, culled from the many that compose a spirited and vigorous pen and ink drawing of FRESHMAN INITIATION, by that talented young artist, E. Alfred Sargent, of New York. The picture, now in the hands of the photo-lithographers, will be 12 × 16 inches in size, beautifully gotten up in two tints. Although the wood-cut but weakly conveys an idea of the life and "nerve" of the original, yet one can see from its character the spirit with which the subject has been handled. As this custom is fast disappearing from American Colleges, it has been our design at this time to produce in this cartoon, by one of the best figure artists in this country, a faithful and artistic representation of that event ever fresh in the memory of the student and alumnus. It will not only be an ornament to the room of every student, but a souvenir of *Alma Mater* to every graduate. This picture will be sent to any one by mail, post-paid, on receipt of price—$1.50—by addressing

# THE COLLEGE COURANT,

*NEW HAVEN, CONN.*

THE COLLEGE COURANT is a large weekly of 16 pages, devoted to College interests, Science and Literature. It has been the most successful of any paper of the kind ever published.

ITS CONTRIBUTORS number above Two Hundred of the ablest College Presidents and Professors in the United States, among which are such names as

PRESIDENT WOOLSEY, OF YALE; PRESIDENT McCOSH, OF PRINCETON;
PRESIDENT CHADBOURNE, OF THE UNIVERSITY OF WISCONSIN;
PRESIDENT HAVEN, OF NORTHWESTERN UNIVERSITY;
PROF. MOSES COIT TYLER, OF THE UNIVERSITY OF MICHIGAN;
PROF. W. A. P. MARTIN, D.D., IMPERIAL COLLEGE, PEKIN, CHINA;
PROF. ALEXANDER WINCHELL, OF THE UNIVERSITY OF MICHIGAN;
And PROFS. PORTER, DANA, DAY, THACHER, HOPPIN, DWIGHT, GILMAN AND NORTHROP, OF YALE.

ITS SCIENTIFIC DEPARTMENT, edited by Prof. G. F. BARKER, M.D., of Yale, contains the freshest and best popular Scientific intelligence. ITS ART COLUMN is edited by one of the best Art critics in the United States.

Its College News and Personal Items are fresh; its College Gossip and Anecdotes, spicy; its articles are always on live subjects; its Local Department, edited by three Seniors in Yale, gives an insight into College life, found in no other place. TERMS—One year, in advance, $4.00. Sample Copies sent on receipt of stamp.

☞ **The Cartoon of Freshman Initiation described above will be presented to every New Subscriber for one year, sent post-paid on receipt of subscription. Address the publisher:**

CHARLES C. CHATFIELD, YALE COLLEGE, NEW HAVEN, CONN.

Jan. 18:2t

## PUBLICATIONS.

**THE MINES OF THE WEST:**

A REPORT TO THE

**SECRETARY OF THE TREASURY.**

Being a full Statistical Account of the

MINERAL DEVELOPMENT OF THE PACIFIC STATES

for the year 1868, with

**Sixteen Illustrations,**

and a Treatise on the Relation of Governments to Mining, with a delineation of the Legal and Practical Mining Systems of all Countries, from early ages to the present time. By

**ROSSITER W. RAYMOND, PH.D.,**

U. S. COMMISSIONER OF MINING STATISTICS.

CONTENTS:

INSTRUCTIONS FROM THE SECRETARY OF THE TREASURY.
LETTER OF THE COMMISSIONER TO THE SECRETARY.
REPORT:
PART I.—Observations of the present condition of the mining industry:
SECTION I.—*Notes on California:*
Chapter I.—The new Almaden mines.
II.—The Mother Lode of California.
III.—The quartz and placer mines of Nevada County.
IV.—Giant powder and common powder.
SECTION II.—*Notes on Nevada:*
Chapter V.—Present condition and prospects of the Comstock mines.
VI.—Ormsby, Washoe, and Churchill Counties.
VII.—Lander County.
VIII.—Nye County.
IX.—Lincoln County.
X.—Esmeralda County.
XI.—Humboldt County.
SECTION III.—*Notes on Montana:*
Chapter XII.—General geological features.
XIII.—Population, property, railroad, etc.
XIV.—Placer mines.
XV.—Quartz mines.
XVI.—Operations of the United States law.
SECTION IV.—*Notes on Idaho:*
Chapter XVII.—Report of Mr. Ashburner.
XVIII.—The War Eagle tunnel.
XIX.—Bullion product.
SECTION V.—*Notes on other mining fields:*
Chapter XX.—Arizona.
XXI.—Utah.
XXII.—The Isthmus of Panama.
PART II.—The relations of government to mining:
Introduction.
SECTION VI.—*Mining law.*
Chapter XXIII.—Mining and mining law among the ancients.
XXIV.—Mining law in the middle ages.
XXV.—The Spanish mining law.
XXVI.—Modern German codes.
XXVII.—The code of France.
XXVIII.—Mining law of Switzerland.
XXIX.—Mining law of England.
XXX.—Mining regulations of Australia.
XXXI.—Mining laws of Canada.
XXXII.—Conclusions.
SECTION VII.—*Mining Education:*
Chapter XXXIII.—Means of disseminating information with regard to mining and metallurgy; the National School of mines.
SECTION VII.—*Mining Education—Continued.*
Chapter XXXIV.—The Freiberg School of Mines.
XXXV.—The Paris School of Mines.
XXXVI.—The Prussian School of Mines.
XXXVII.—The School of Mines at Clausthal.
APPENDIX.—Statistics of bullion, ores, etc., at San Francisco, for the year 1868.

EXTRA CLOTH, $1 75.

Address,

**WESTERN & CO.,**
No. 37 PARK ROW, New York.

## PUBLICATIONS.

**"THE**

**MANUFACTURER and BUILDER"**

**AN ILLUSTRATED MAGAZINE OF INDUSTRIAL PROGRESS.**

Aside from those purely commercial objects which form the mainspring of every business undertaking, the publishers of THE MANUFACTURER AND BUILDER seek to promote the *diffusion of useful, practical knowledge*, and to furnish to those engaged in the industrial arts a journal which will enable them to keep abreast of the wonderful developments which in these modern times result from the application of science to the arts. Without being trammelled by any special classification, or confined in its scope by the narrow limits of any particular trades or professions, they would offer the following synopsis as presenting a few of the prominent topics which have been discussed in its pages.

### ARCHITECTURE.

This subject has been treated both as one of the fine arts and as a means of providing shelter for man and his works. Every improvement connected with the art of building, whether that improvement relates to beautifying the appearance, increasing the value, strength, and durability, or lessening the cost of erection, finds a legitimate place in its pages.

### THE MOTORS,

Amongst the great agents in the improvement of the arts, none are more important than the Motors—steam, water, and wind. These, in all their various modifications, will receive full attention, and every improvement will be carefully noted and discussed.

### SCIENCE APPLIED TO THE ARTS,

As, for example, the application of modern chemical discoveries to dyeing, of electricity to various processes, of magnetism to the examination of iron, have all received attention at the hands of the editors.

### THE HOME DEPARTMENT

Is devoted to matters of immediate interest to the domestic circle, whether that matter be of practical or merely general interest. In short, everything of interest to our American homes may here be legitimately discussed.

### ILLUSTRATIONS.

In connection with these varied subjects, the journal, during the first six months, contained upwards of 150 illustrations, some of which were of a degree of artistic excellence rarely seen in purely technological journals.

### FORM AND SIZE.

Each number of THE MANUFACTURER AND BUILDER comprises 32 large quarto pages, cut, stitched, and bound within an engraved cover. At the close of every year subscribers have a book, when bound, of

**384 Pages, with upwards of 300 Engravings.**

In presenting to the public the peculiar features of THE MANUFACTURER AND BUILDER, we have preferred to speak in the past tense. We have referred to what we have done as an earnest of what we hope to accomplish in the future. One object that we have kept steadily in view is the increase of our circulation, so that, as an

**Advertising Medium,**

THE MANUFACTRUER AND BUILDER may ultimately rival any journal in the country. We have sought to effect this by placing the subscription price at the extremely low figure of

**One Dollar and a Half per Year,**

with liberal discounts to those who may get up clubs.

The advertising rate is $3.75 for one-half inch space per month, or 75 cents per line each insertion. Special contracts made for long periods.

A specimen copy of THE MANUFACTURER AND BUILDER will be sent free to parties contemplating advertising or getting up clubs.

Address,

**WESTERN & COMPANY, Publishers,**
37 Park Row, New York.

## PUBLICATIONS.

NOW READY.

**Third Edition, Seventh Thousand, Revised, Enlarged, and Improved,**

**HOPTON'S CONVERSATIONS on MINES,**

BETWEEN

**FATHER AND SON,**

ENLARGED FROM 112 TO 192 PAGES.

**The Following are the Contents:**

Air, why it is propelled down, into and around the workings
" Quantity of, produced by the furnace.
" Friction of
" The great friction of produced by one mode of ventilation, and how reduced by another
" Pure added to impure (plans.
" Splitting of (plans)
" One current of (plans)
" One current of, and how to adopt separate currents (plan)
" Dividing of, but not into "separate and and distinct" current (plans)
" Crossings (see H on plans)
" Weight of in shafts
" How to find the weight of
" Table of pressure in shafts
" Expansion of
" Its velocity and force
" Rush of, into each division
" Quantity produced by natural ventilation
" Splitting, why it should be adopted
" Splitting, why the workmen object to Mr. Hopton adopting the mode
Anemometer, measurement of air by, engraving of
Area of a pit, how to find
Barometers, Showing the time of an outlet of gas in mines (engraving)
Bricks, how to find the number in the walling of a shaft.
Buddle's plan
Circumference of a pit, how to find
Coal, several ways of working it out, and why man methods of working it out are adopted
" Working out in banks (plans)
" Working it out in following up banks (plan)
" Working out in pillars (plans)
" Working out in long wall (plans)
" Working out in drifts (plans)
" Working out with no regularity (plan)
" Working out by the "end way" or in endings (plan)
Cubical Contents of a pit, how to find
Dialing, the mode of
Dials, several engravings
" How constructed
" How fixed in mine surveying
" Needle, its variations
Diameter of shaft
Dip of mine, how to find and lay on (plan)
Explosion, the power of an
" At Lund-hill, in what part of the mine it was supposed to take place (plan)
" How the power may be diminished
Furnace, how to find the horse-power of
" The place of fixing, to produce the largest ventilating current
" Engravings of ground floor, front and back view
" Remarks upon
Gases, (carbonic acid) composition of
" Do. properties of
" (After, or choke damp) composition of
" (Carburetted hydrogen) do.
" Choke damp and carbonic acid, not one and the same in quality
" The effect produced on people by inhaling such
" The quantity required for an explosive mixture
" The elasticity of
" The weight of
" The nature and quality of
" Why some mines generate and produce more than others
" Why some mines generate a mixture of
Goaf, or gob, how tramrods are made through (plan)
Lund-hill (plan)
Managers, who are best competent to manage mines
Miscellaneous questions
Natural ventilation
Planning, how workings are laid on the plan
Regulations (see R on plans)
Safety Lamps, why flame will not penetrate through, engraving of
Sections on mechanical ventilation
Summary of accidents
Surveying, how mines are with the dial
Surveying, how mines are with the theodolite
Tables of weights and measures
Temperature on surface
Temperature in mines
Temperature, difference of between down and up-cast
Theodolites for mine surveying
Theodolites, how constructed
Theodolites, the magnetic needle dispensed with, and how workings are laid on plan, with Theodolite surveying
Theodolites, how mines are surveyed with them
Up-cast larger than down-cast (plan)
Ventilating mines by mechanical power
Ventilation, several ways of
Weather, how a change of affects the workings
Workmen, capabilities of

**Testimonials, Reviews, etc.**

"Such a work, well understood by miners, would do more to prevent colliery accidents than an army of inspectors."—*Colliery Guardian.*

"The book cannot fail to be well received by all connected with collieries."—*Mining Journal.*

"Its contents are really valuable to the miners of this country."—*Miner's Conference.*

"I have works priced at £4 that do not contain the same information."—W. W. KENRICK, Colliery Viewer.

"The work is replete on the subject of underground management."—M. BARNES, Colliery Proprietor.

"I have had twenty years' management. It is the best work I ever read, and deserves to be circulated in every colliery district."—JOSEPH EAMES.

**WESTERN & CO.,**
Sole Agents for the United States.

For sale at the office of the ENGINEERING AND MINING JOURNAL, 37 Park Row, New York, and through any Bookseller. Price $1.

---

**COAL, IRON, AND OIL.**

BY DADDOW AND BANNAN.

**The Great Work on our National Resources.**

A large Octavo Volume, 808 pages, with upward of 200 Maps and Engravings.

The *Scientific American* says: "It is the most practical and exhaustive treatise on the subject that has come under our observation, and one that deserves to be read by all intelligent men."

The London *Mining Journal* says: "A more comprehensive and exhaustive volume upon the materials treated of could scarcely be desired. * * * It may safely besaid that we have no single work in this country so thoroughly calculated to afford the superior collier and iron worker all the information he requires in connection with his business."

Persons desiring to settle in the South will find this book invaluable, as it points out the best places for mining and manufacturing purposes.

The first edition is nearly exhausted, and no other edition, owing to the expense, will be published for several years. Price, $7 50 cloth; half turkey, $10.

☞ For sale also in New York, at the Office of THE ENGINEERING AND MINING JOURNAL, wholesale and retail. mh18-tf

---

## PUBLICATIONS.

PUBLICATIONS OF THE

**AMERICAN INSTITUTE OF ARCHITECTS.**

—o—

**WESTERN & COMPANY**

Having made arrangements with the Committee on Library and Publications of the above Association, are prepared to furnish the publications of the Institute to the trade and the public.

The Publications consist of the Proceedings of the Annual Conventions of the Institute, and Papers read before the Chapters of that body, as well as Papers contributed by Members of the Institute and published by its Committee on Library and Publications.

They are elegantly printed Pamphlets of large quarto size, with two columns to a page.

The Pamphlets thus far issued comprise the publications for two years past, and cover transactions of three years.

**LIST OF PUBLICATIONS TO DATE.**

I.

*PROCEEDINGS OF THE ANNUAL CONVENTION OF THE*

**American Institute of Architects,**

Held in New York, October 22d and 23d, 1867.

Comprising, Minutes of the Convention, The Annual Address by Richard Upjohn, President; Reports of the Trustees and Standing Committees, and the Closing Address.

32 Pages, Quarto.....Price, 30 cents.

II.

**FIRE-PROOF FLOORS**

FOR

**Banks, Insurance Companies, Office Buildings, and Dwellings.**

Tables Shewing the Distances from Centres at which Rolled Iron Beams should be Placed, and the Weight of Metal per superficial foot of the Floor,

By R. G. HATFIELD, F. A. I. A.

8 Pages, Quarto.....Price, 30 cents

III.

**Proceedings**

OF THE

**SECOND ANNUAL CONVENTION**

Held in New York, December 8, 1868

Comprising the Minutes of the Convention, The President's Address by Richard Upjohn, Esq., and the Reports of Trustees and Standing Committees.

16 Pages, Quarto.....Price 40 cents

IV.

**REMARKS**

ON

**FIRE-PROOF CONSTRUCTION;**

A Paper read before the New York Chapter of the American Institute of Architects, April 8, 1869.

By P. B. WIGHT, F. A. I. A.

8 Pages, Quarto.....Price, 30 cents.

V.

THE

**Architectural and Other Art Societies of Europe;**

SOME ACCOUNT OF THEIR

ORIGIN, PROCESSES OF FORMATION, AND METHODS OF ADMINISTRATION,

With suggestions as to some of the conditions necessary for the maximum success of a National American Architectural-Art Society, with its local dependencies.

By A. J. BLOOR,

FELLOW OF THE AMERICAN INSTITUTE OF ARCHITECTS

Read before the New York Chapter A. I. A., February 16, 1869.

62 Pages, Quarto..... Price, $1

The above Pamphlets may be had singly, and will be sent by mail to any address on receipt of the price.

THE TRANSACTIONS BOUND.

The Publications of the Institute may also be had bound in cloth, making a handsome quarto volume of 126 pages, comprising the Transactions of the Institute for three years, ending November 16, 1869, the time of holding the Annual Convention for the present year. Price, $3.

WESTERN & COMPANY will offer for sale the Proceedings of the Annual Convention, held on the 16th and 17th of November, 1869, as soon as issued. Orders will now be received.

WESTERN & COMPANY will also publish the papers to be read at the meetings of Chapters of the Institute, during the coming year in the ENGINEERING AND MINING JOURNAL, and abstracts in the MANUFACTURER AND BUILDER, which will be duly announced. Address

**WESTERN & COMPANY**

No. 37 PARK ROW, NEW YORK.

---

## COAL SHIPPERS.

E. B. ELY & CO., SHIPPERS OF

**COAL,**

33 TRINITY BUILDING, 111 BROADWAY,

NEW YORK.

"Old Company's" Lehigh, J. H. Swoyer's Enterprise, Wyoming, Wilkesbarre, and Locust Mountain Bituminous Coal.

E. B. ELY,
S. W. ELY,

ap24-1y-q

---

POWELTON COAL AND IRON COMPANY, Sole Shippers of the Celebrated

**Powelton Semi-Bituminous Gas**

AND ANTHRACITE COALS,

**104 Walnut street, Philadelphia.**

BRANCH OFFICES:

New York, Trinity Building; 17 Doane street, Boston; Cleveland, O.; Pittsburgh, Pa. jan30-is

---

SAMUEL BONNELL, JR., OFFERS FOR SALE his SUGAR CREEK and HONEY BROOK

**LEHIGH COALS,**

OFFICE:

43 and 45 TRINITY BUILDING, 111 BROADWAY,

NEW YORK.

---

HONEY BROOK COAL COMPANY, Exclusive Miners and Shippers of the Celebrated

**Honey Brook Lehigh Coal,**

No. 111 BROADWAY, NEW YORK.

JAMES H. LYLES, Agent.

Wharves, Port Johnson, N. J. Philadelphia office, 209 Walnut street.

ap20-1y J. B. McCREARY, President.

---

WILKESBARRE COAL, DELIVERED DIRECT from the Mines of

**The Wikesbarre Coal and Iron Co.,**

or for re-shipment at

HOBOKEN AND JERSEY CITY.

OFFICE:

ap1-1y No. 80 Broadway, New York.

---

WHITE, FOWLER & SNOW, SUCCESSORS TO JOHN WHITE & CO.,

**Wilkesbarre and Lehigh Coal,**

FOR STEAM AND FAMILY USE.

OFFICE:

Room No. 75, 111 BROADWAY, (Trinity Building).

jan1-1y

JNO. WHITE,
LINDLEY H. FOWLER,
LOUIS T. SNOW.

---

THE NEWBURGH ORREL COAL COMPANY.

Mines at Newburgh, Preston Co., W. Va.
Company's Office, No. 52 S. Gay St. Baltimore, Md.

C. OLIVER O'DONNELL.....President.
G. W. MAHOOL.....Secretary.

This Company offer their very superior Gas Coal at lowest market prices.

It yields 10,936 cubic feet of gas to the ton of 2,240 lbs., of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.

It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York, the Brooklyn and Citizens' Gas Light Companies of Brooklyn, N. Y., the Baltimore Gas Light Company of Baltimore, Md., and Providence Gas Light Company, Providence, R. I.

The best dry coals shipped, and the promptest attention given to orders. sep2'1y

---

COXE BRO.'S & CO., CROSS CREEK COAL, Miners and Shippers of the Celebrated

**Cross Creek Free Burning Lehigh Red Ash COAL.**

FROM THE BUCK MOUNTAIN VEIN.

OFFICES;

Philadelphia, No. 341 Walnut street.
Drifton, Jeddo P. O., Luzerne Co., Pa.

Agent in New York, SAMUEL BONNELL, Jr., Room 43, Trinity Building,

feb-1y 111 Broadway.

---

## MISCELLANEOUS.

D. W. LEE & CO.,

**Stationers and Blank Book**

*MANUFACTURERS,*

**82 Nassau street, near Fulton, New York**

Have obtained the sole right to Manufacture the

**PATENT SELF-CEMENTING BANDS,**

for Bank bills, currency, or any package where a band is required.

Put up in boxes at $1 50 per 1,000.

Send for sample, free. sep11-t

---

ED. SEARS' WOOD-ENGRAVING ESTABLISHMENT.

Engraving, Designing, and Photographing on Wood, in all its branches, viz: Portraits, Fine Book Work, Machinery, Maps, Buildings, Illustrated Catalogues Views, etc.

N. B. Special attention given to Color Work of all descriptions.

48 *BEEKMAN STREET, NEW YORK.*

---

BENJAMIN SMITH LYMAN,

MINING ENGINEER,

GEOLOGIST AND TOPOGRAPHER,

No. 135 South Fifth Street, Philadelphia.

---

AGENTS AND CANVASSERS WANTED.

IN EVERY CITY AND TOWN IN THE UNITED STATES,

FOR THE

**Engineering and Mining Journal.**

Liberal inducements. Specimens sent free. Address

WESTERN & COMPANY,

37 Park Row, New York.

---

## COAL SHIPPERS.

PIER No. 14 NORTH PT. RICHMOND.

C. J. & J. H. EASTWICK & CO., SHIPPERS of

**White and Red Ash Coal,**

No. 228 DOCK STREET, PHILADELPHIA, and No. 19 DOANE STREET, BOSTON.

BURNSIDE RED ASH, SHAMOKIN WHITE ASH, LOCUST MOUNTAIN WHITE ASH COAL.

jan-1y-is s.a

---

THE DESPARD COAL COMPANY OFFER their Superior DESPARD COAL to Gas Light Companies throughout the country.

MINES IN HARRISON COUNTY, West Virginia.
Wharves, Locust Point, Company's Office, No. 29 South st. } Baltimore.

AGENTS:

PARMELE BROTHERS, No. 32 Pine street, New York.
BANGS & HORTON, No. 31 Doane street, Boston.

Among the consumers of Despard Coal we name Manhattan Gas Light Co., New York; Metropolitan Gas Light Co., New York; Jersey City Gas Light Co., Jersey City, N. J.; Washington Gas Light Co., Washington, D. C.; Portland Gas Light Co., Portland, Maine.

☞ Reference to them is requested. may30-1y

---

LEWIS AUDENRIED & CO., MINERS AND Shippers of the following celebrated ANTHRACITE COALS.

From Philadelphia and the Mines,

DIAMOND, Red Ash; SPOHN, Red Ash; ORCHARD, Pink Ash; BROAD MOUNTAIN, White Ash; LOCUST MOUNTAIN, White Ash; BLACK HEATH, White Ash; Old Company's Lehigh; Wilkesbarre.

From Port Johnston and Jersey City,

Old Co.'s Lehigh, Hazleton, Wilkesbarre, and Shenandoah Coals.

Also the superior CUMBERLAND COALS.

| BROAD TOP, | BARTON, | BARTON, |
|---|---|---|
| SEMI-BITUMINOUS, at Philadelphia. | GEORGES CREEK, at Baltimore. | GEORGES CREEK, at Alexandria. |

205 Walnut street, Philadelphia; 14 Kilby street, Boston; 34 Westminster st., Providence; 24 Second st., Baltimore.
110 BROADWAY, NEW YORK.

---

W. D. CRANE & CO.,

SHIPPERS OF

**Anthracite and Bituminous Coal,**

For Iron and Steam purposes.

NEW YORK: 115 Broadway. | BOSTON: 26 Kilby Street.

apr10tf

---

VAN WICKLE & STOUT, Miners and Shippers of

**Fulton & Stout Lehigh Coals.**

☞ OFFICE, 119 BROADWAY, ROOM 18, NEW YORK. ☜

Our Fulton Lump is a superior article for FOUNDRY USE. feb20-1y

---

G. B. LINDERMAN & CO.,

MINERS,

**Sugar Loaf, Lehigh Coal.**

OFFICE, 50 TRINITY BUILDING, 111 BROADWAY,

may23-1y NEW YORK.

---

DAVIDSON, YOUNG & CO.,

Sole Agents for the sale of J. J. CONNER'S "GIRARDVILLE" AND "McMICHAEL" LOCUST MOUNTAIN AND "DUNCAN" RED ASH COALS.

Also, dealers in the best varieties of Lehigh, Shamokin and Wilkesbarre

**COALS.**

16 TRINITY BUILDING, New York.
19 DOANE STREET, Boston.
328 WALNUT STREET, Philadelphia.
HATCH & TYLER, Hartford, Conn.

may1-1y BOX 1371, P. O., N. Y.

---

RANDOLPH BROTHERS, Sole Agents of the original

**Spring Mountain Lehigh Coal,**

Extensively used for Smelting Iron.

☞ Rooms, 28 and 30 Trinity Building,

apr6tf NEW YORK.

---

CENTRAL COAL M. AND M. COMPANY,

15 AND 17 TRINITY BUILDING,

**NO. 111 BROADWAY, NEW YORK.**

MINERS AND SHIPPERS OF

**George's Creek Cumberland Coal.**

HENRY A. SMYTHE, President. F. P. WHITE, Sec. and Treasurer.

Sept 28-1y

---

PICTOU COAL! THE UNDERSIGNED ARE prepared to contract for the delivery of *this well-known* COAL, either on board vessel at Pictou, or at any port in the United States.

*Sample parcels sent as required.*

BIRD, PERKINS & JOB,

39 India Wharf, Boston, 86 South street, New York.

aug10-3m

---

**CUMBERLAND COAL AND IRON COMPANY.**

**Semi-Bituminous Coal from the Hoffman, Astor, and Eckhart Mines,**

For Steam and Manufacturing purposes. Delivered at NEW YORK, GEORGETOWN, OR BALTIMORE

**Office, 90 Broadway, Cor. of Wall-St., New York.**

WM. M. RICHARDS, President, New York,
E. H. TRACY, Eng. and Supt., Cumberland, Md.

Aug. 31-1y

---

H. N. BURROUGHS, Prest. H. T. SHILLINGFORD, Sec'y.
H. H. SHILLINGFORD, Treas.

KITTANING COAL COMPANY, SOLE MINERS and Shippers of

**Bituminous Coal,**

FROM THE COLLERIES:

Tunnel Hill (Lemon Vein), Gallitzin, Cambria Co.
Beaverton, (Phœnix Vein), Osceola Mills, Clearfield Co.

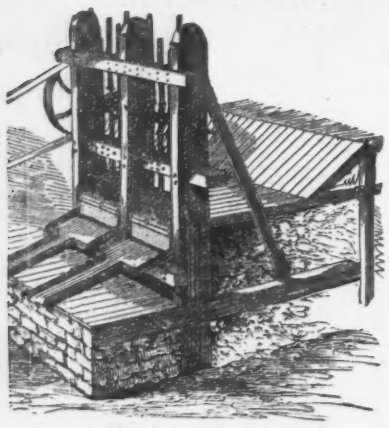
Unequalled for Steam, Rolling Mills, Forges, Glass Works, Brick Kilns, Lime Kilns, and Coke, for the Manufacture of Steel, etc.

OFFICE:

126 South Fourth street, (Forrest Place), Phila. jy6-6m

## MINING MACHINERY, ETC.

MINING MACHINERY OF ALL KINDS.



### CALIFORNIA STAMP MILLS,

WITH IRON OR WOOD FRAMES.

Rock Breakers, Excelsior Grinders, Amalgamators, Pans, Separators, Wet & Dry Concentrators, Mining Supplies, Wheeler & Randall's Quartz Reducing Amalgamating & Concentrating Machinery, Engines, Boilers, and Fixtures. All kinds of Pans and Amalgamators, and Quartz Mills for reducing Gold and Silver Ores, the same as built in San Francisco, California, and at lower prices.

We are now building the

**HOWLAND PATENT ROTARY BATTERY**

of 12 stamps. It requires no wood frame to put it up. Guaranteed to crush 2½ to 3 tons per day to the stamp. The best Battery ever used for amalgamating gold, or crushing silver ores, dry or wet. Can be put up on a mine in running order for one-half the price of the straight battery, and in three days after its arrival at the mine. Weight complete, ready for the belt, 18,000 pounds. Cost, $3,000 currency, for 12-stamp battery.

☞ Send for a Circular.

Address

MOREY & SPERRY,
95 Liberty Street New-York.

---

KROM'S DRY ORE CONCENTRATOR.

**Concentration by means of Air**

has long been attempted, but hitherto without satisfactory results. **S. R. Krom** has invented and patented machines which concentrate the various ores more perfectly than can be done by any other means.

The *MECHANICAL COMBINATIONS* are extremely simple, the machines therefore correspondingly durable. A continuous self-delivery of ore on one side and tailings on the other is effected, hence very little attention is required except keeping the hopper supplied with ore. The power of one man is sufficient to operate a machine that will concentrate one ton per hour.

*PARTIES INTERESTED IN MINING* are invited to call at No. 210 Eldridge Street, New York, where they may see a machine in operation, and have samples of their own ores crushed and concentrated.

Illustrated Circulars may be had on application to

STEPHEN R. KROM,
jan10 1y-is No. 210 Eldridge Street, N. Y.

---

B. KREISCHER,

NEW YORK FIRE BRICK AND

STATEN ISLAND

**Clay Retort Works.**

Established 1845.

Office, 58 Goerck Street, Corner Delancy Street, East River, New York. mar28-1y-q

## INSTRUCTION.

SCHOOL OF MINES, COLUMBIA COLLEGE.

FACULTY.—F. A. P. BARNARD, S.T.D., LL.D., PRESIDENT; T. EGLESTON, JR., E. M., Mineralogy and Metallurgy; C. F. CHANDLER, PH. D., Analytical and Applied Chemistry; JOHN TORREY, M.D., LL.D., Botany; C. A. JOY, PH. D., General Chemistry; W. G. PECK, LL.D., Mechanics; J. H. VAN AMRINGE, A.M., Mathematics; O. N. ROOD, A.M., Physics; J. S. NEWBERRY, M.D., LL.D., Geology and Paleontology. Regular courses for Mining Engineering; Metallurgy; Geology and Natural History; Analytical and Applied Chemistry. Special students received for any of the branches taught. Particular attention paid to Assaying. For further information and catalogues, apply to

DR. C. F. CHANDLER,
nov21-1y-is Dean of the Faculty.

---

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N. Y., a School of

ENGINEERING AND PRACTICAL SCIENCE.

Founded, 1824.

The courses of instruction, each extending over four years, are

1. CIVIL ENGINEERING.
2. MINING ENGINEERING.
3. MECHANICAL ENGINEERING.
4. NATURAL SCIENCE.

Degrees conferred in the different departments.

Applicants for admission must not be less than 16 years of age.

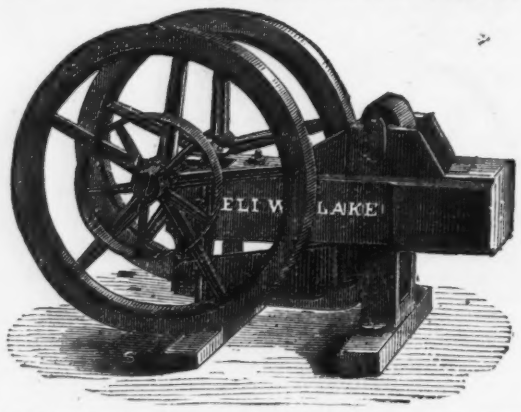
The course in Geodesy includes extensive engineering field practice. The proximity of iron, steel, and machine works, together with railroads, canals, and bridges affords great facility for thorough practical instruction. Laboratory privileges unsurpassed. Special courses in Assaying.

For Annual Register giving full particular apply to

Prof. CHARLES DROWNE, Director.

## MINING MACHINERY.

### BLAKE'S STONE BREAKER.




The office of this Machine is to break Ores and Minerals of every kind into small fragments, preparatory to their further comminution by other machinery.

This machine has now been in use, enduring the severest tests, for the last ten years, during which time it has been introduced into almost every country on the globe, and is everywhere received with great and increasing favor as a labor-saving machine of the first order.

Illustrated circulars, fully describing the machine, with ample testimonials to its efficiency and utility, will be furnished on application, by letter to the undersigned.

☞ The Patents obtained for this machine in the United States and in England having been fully sustained by the courts, after well contested suits in both countries, all persons are hereby cautioned not to violate them; and they are informed that every machine now in use or offered for sale, not made by us, in which the ores are crushed between upright convergent faces or jaws actuated by a revolving shaft and fly-wheel, are made and used in violation of our patent.

Mch. 14-1y. **BLAKE BROTHERS, New Haven, Conn.**

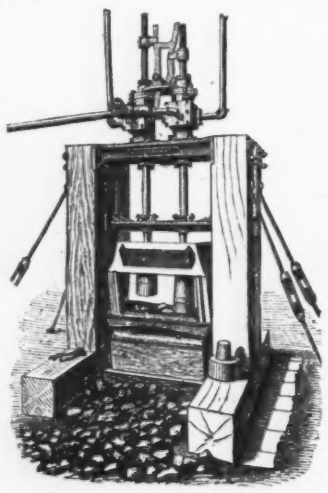
---

THE WILSON PATENT

**Steam Stamp-Mill Company,**

OF PHILADELPHIA, PA.

Are now prepared to supply Miners and other parties with their



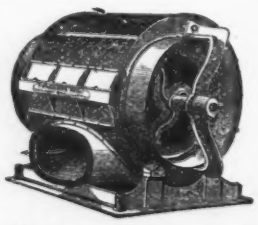
**New Steam Stamp-Mills**

AT THE SHORTEST NOTICE.

These Mills have now been in operation for upwards of a year, and have proved to be the most durable and efficient, as well as the lightest for transportation, of any mills now used. The valve gear is of the simplest and most durable construction, readily adjustable by movable cams on the piston rods or stamp stems, thereby giving the operator absolute control of the length and velocity of motion and force of the blow. These Mills are adapted for both dry and wet crushing, and for the hardest rock or softest cement. These Mills are every way equivalent to a Twenty Stamp Mill. For further particulars call on or address

THE WILSON PATENT STEAM STAMP-MILL COMPANY,
Aug31-1y 326 Walnut street, Philadelphia.

---



**SMITH & SAYRE**

*MANUFACTURING CO.*,

PROPRIETORS AND

MANUFACTURERS

OF THE

**Mackensie Patent**

BLOWER and CUPOLA and SMELTING FURNACE.

Also, Mackensie's Patent GAS EXHAUSTER and COMPENSATOR. Address

SMITH & SAYRE

MANUFACTURING COMPANY,

95 Liberty street, N. Y. Send for illustrated phamphlet.

Mar26-1y

---

ALBERT BRIDGES,

MANUFACTURER AND DEALER IN

**Railway and Mining Supplies and Machinery.**

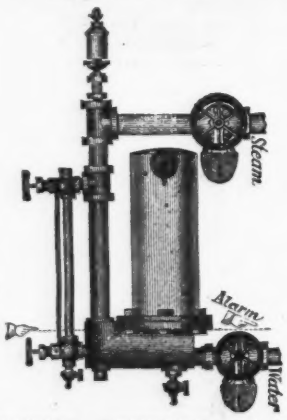
Bolt and Cold Punched Nuts, Bolts, Lag Screws and Washers. Belting, Packing, Hose, Rubber Springs, Car Trimmings, Steam Pumps.

**Ball's Patent Telescope Jack.**

NO. 46 CORTLANDT STREET,
P. O. Box, 2843. NEW YORK.
Aug 31-1y

---

NEYNABER'S MONITOR LOW-WATER INDICATOR FOR STEAM BOILERS.




*SIMPLICITY, PRECISION OF ACTION AND DURABILITY.*

This Indicator has no equal. It it superior to any Low-Water Indicator in use. In use at the U. S. Mint, Phila.; Treasury Department and Agricultural Department, Washington, and Post Office Philadelphia, and many others. A. F. W. NEYNABER, Gen. Agent,
425 Girard avenue, near Fourth st., Philadelphia, Pa.
nov. 16:1y

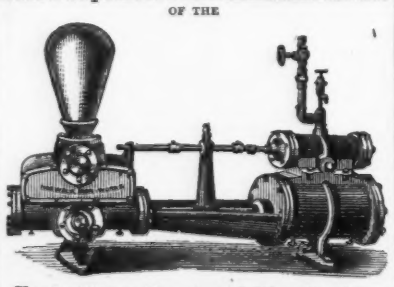
---

NORWALK IRON WORKS,

SOUTH NORWALK, CONN.,

Sole Proprietors and Manufacturers

OF THE



**Earle Steam Pump and Fire Engine,**

(Patented in the United States, France, England and Belgium.)

Air and Vacuum Pumps,

STEAM AND BLOWING ENGINES,

Pumping Engines for Water Works, Horizontal and Tumbling Beam Engines, Mining, Wrecking, and Supply Pumps.

IRON AND BRASS CASTINGS, of every description.

☞ Send for illustrated Catalogue. mch18-1y-is

## STEAM PUMPS.

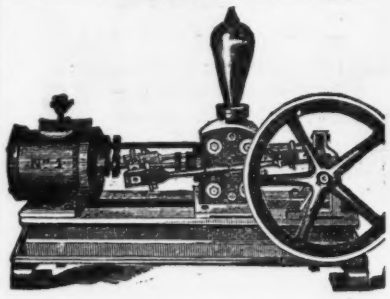
THE WOODWARD

**Steam Pump Manufacturing Company.**

MANUFACTURERS OF THE

WOODWARD PATENT IMPROVED SAFETY

**Steam Pump and Fire Engine.**



STEAM, WATER, AND GAS FITTINGS OF ALL KINDS.

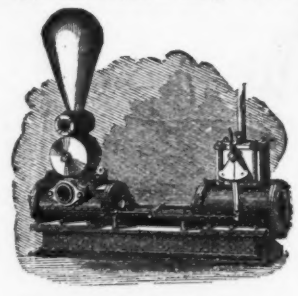
Also dealers in WROUGHT IRON PIPE, BOILER TUBES, etc. Hotels, Churches, Factories, and Public Buildings, heated by Steam, Low Pressure.

Woodward Building, 76 and 78 Centre street, corner Worth street, New York. Formerly 77 Beekman street.

mar 14-1y GEORGE M. WOODWARD, Pres't.

---

Niagara Steam Pump Works.




CHARLES B. HARDICK,

**9 ADAMS STREET, BROOKLYN, N. Y.**

Sole Manufacturer of

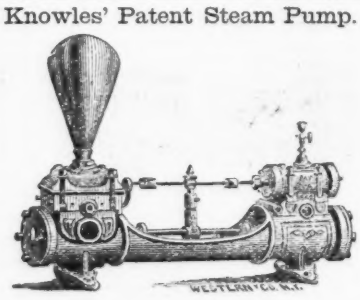
HARDICK'S PATENT DOUBLE-ACTING

**Steam Pump and Fire Engine.**

Patented in England, Belgium and France. Send for circular. feb-13-1y

---

Knowles' Patent Steam Pump.



FACTORIES AT WARREN, MASS.

WAREHOUSE, NO. 126 LIBERTY STREET, NEW YORK.

Air Pumps, Blowing Engines, Hydraulic Pressure Pumps, New Locomotive Pumps, Fire Pumps, Boiler, Feed, Marine, Drainage, Sugar-work, Brewery, Distillery, Oil and Wrecking Pumps.

Improved Horizontal and Vertical

**MINING PUMPS**

(Working with Plungers, and especially arranged for pumping water containing dirty or gritty matter.)

Pumps for every possible duty, and all fully guaranteed. Also,

KNOWLES' PATENT SAFETY BOILER FEEDER

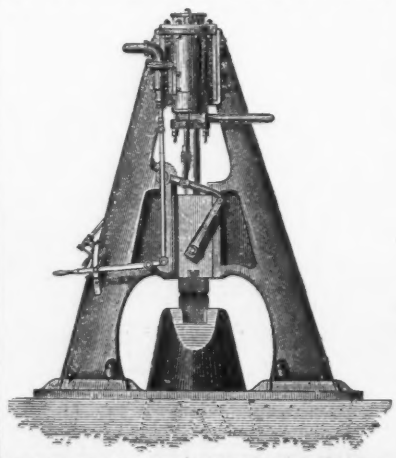
Send for Illustrated Circular. 10-1yjuly

## IRON WORKS.

WM. A. SWEET & CO., NO. 33 WYOMING STREET, SYRACUSE, N. Y.,

MANUFACTURERS OF

**STEAM-HAMMERS,**

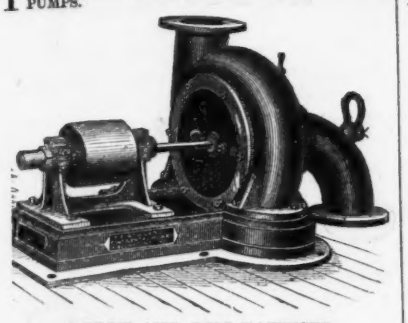


ELLIPTIC SPRINGS, CAST-STEEL CROWBARS.

Sweet's Celebrated Steel Axes, and Cast-Steel Sleigh and Cutter Shoes. nov. 16:6m

## STEAM PUMPS.

IMPROVED MINING AND WRECKING PUMPS.



LEBBY AND DUC PATENTS.

MANUFACTURED SOLELY BY

**T. F. ROWLAND, CONTINENTAL WORKS,**

Greenpoint, Brooklyn, N. Y.

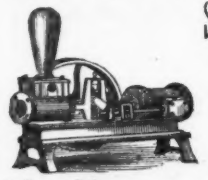
New York Office, No. 64 Broadway, Room 33.

☞ Send for Illustrated Circular. july16-1y-is

---

J. CLAYTON'S

**Patent Fly Wheel and Direct Action**



STEAM PUMPS,

**HAND PUMP AND STEAM ENGINE**

COMBINED.

These pumps are the cheapest first-class pumps in the market.

All sizes made to order at short notice.

**JAMES CLAYTON, 24 & 26 Water st.,**

Nov18-tf Brooklyn, N. Y.

---

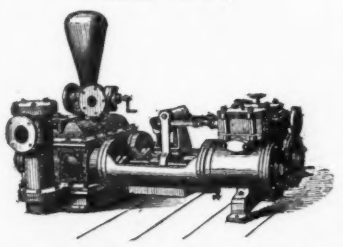
HYDRAULIC WORKS.

MANUFACTORY,

**BROOKLYN, N. Y.**

Steam Pumping Engines, Single and Duplex, Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,

MINING PUMPS,



Water Meters, Oil Meters; Water Pressure Engines; Stamp Mills for Gold, Silver and Copper Ore; Eaton's Patent Amalgamators for Gold and Silver; Steam and Gas Pipe, Valves, Fittings, etc. Iron and Brass Castings.

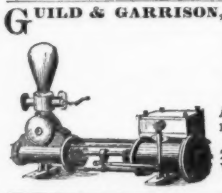
☞ Send for Circular.

H. R. WORTHINGTON,

feb1-1y 61 Beekman street, New York.

---

GUILD & GARRISON, MANUFACTURERS OF



**Steam Pumps,**
**Vacuum Pumps,**
**Steam Engines,**
**Vacuum Pans,**

And all the various connections. For sale at the STEAM PUMP WORKS, 26, 28 and 30 First street, Williamsburgh, N. Y.

sep14-6m

## MISCELLANEOUS.

CORLISS STEAM ENGINE COMPANY., (Incorporated June, 1856.)

GEORGE H. CORLISS, PRESIDENT.
WILLIAM CORLISS, TREASURER.

**PROVIDENCE, R. I.,**

MANUFACTURERS OF

**STATIONARY AND MARINE ENGINES AND BOILERS.**

**Engines** ranging from **15 h. p.** to **1,000 h. p.,**

FURNISHED ON SHORT NOTICE.

These Engines, manufactured under the several patents granted GEO. H. CORLISS, secure a perfectly uniform motion, under all variations of resistance, and SAVE THEIR COST IN FUEL IN FROM 3 to 5 years. Our facilities and capacity are unsurpassed by any establishment in our line. Sept 28 tf

---

DUNCAN, SHERMAN & CO.,

BANKERS,

Corner of Pine and Nassau Streets, New York.

Circular Notes and Letters of Credit for Travelers, available in all the Principal Cities in the World.

TRANSFERS OF MONEY TO EUROPE AND THE PACIFIC COAST BY TELEGRAPH.

☞ Interest allowed on Deposits. feb-1y

---

CIRCULAR SAW MILLS, PLANERS, MATCHES, ETC. Prices Low. J. HEALD & SON, Barre, Mass., Iron Founders and Machinists, make the

LARGEST AND BEST PLANER

to be found for the money. Send for Circulars.

Dec. 7:3m

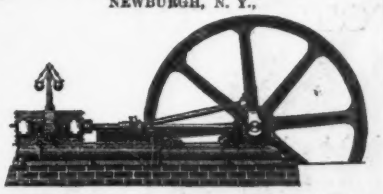
---

FOR SALE AT HORSESHOE 10-STAMP MILL, California pattern, with twenty-five horse-power engine and thirty horse-power boiler, new and in good condition. For particulars and terms, address "STAMP-MILL," care of the ENGINEERING AND MINING JOURNAL, nov. 9:tf. o.s.

## ENGINEERS' SUPPLIES.

THE WASHINGTON IRON WORKS,

NEWBURGH, N. Y.,



**PREMIUM STEAM ENGINE,**

WITH

WRIGHT'S PATENT CUT-OFF BY THE GOVERNOR.

MARINE ENGINES AND BOILERS of all descriptions, HIGH AND LOW PRESSURE;

**PUMPING ENGINES.**

for WATER WORKS, warranted to give the LARGEST DUTY with the smallest consumption of fuel.

**SUGAR-CANE MILLS.**

with suitable Steam Engines, Boilers, and attendant Machinery, Vacuum Pans, Coolers, Tanks, and Refining Machinery.

Manufacturers of

ATWOOD'S PATENT

**SAFETY ELEVATORS AND HOISTING MACHINES.**

Plain and Ornamental

**IRON WORK FOR BUILDINGS,**

WROUGHT AND CAST-IRON BRIDGES.

ALSO,

GEARING, SHAFTING, IRON AND BRASS

CASTINGS.

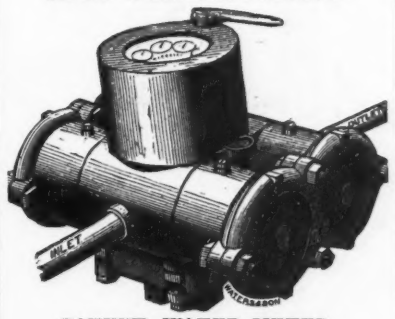
Address WASHINGTON IRON WORKS, NEWBURGH, N. Y.

☞ New York Office, No. 57 LIBERTY STREET.

sep7-6m.

## MACHINISTS' SUPPLIES.

H. R. WORTHINGTON'S



**PATENT WATER-METER.**

This Meter is also Used for the Measurement of Oil.

IT COMBINES

ACCURACY, SIMPLICITY, AND REMARKABLE DURABILITY,

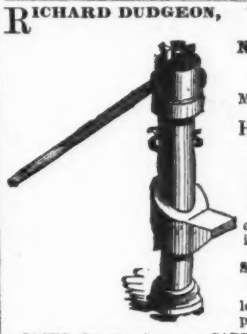
with such ease and certainty of motion as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our larger cities.

HENRY R. WORTHINGTON,

sept-13-1y No. 61 Beekman street, N. Y.

---

RICHARD DUDGEON,



**No. 24 Columbia st.,**

NEW YORK,

Maker and Patentee of

Hydraulic Jacks

AND

**Punches,**

Roller Tube Expanders, and Direct Acting

**Steam Hammers.**

Communications by letter will receive prompt attention.

JACKS for pressing on CARWHEELS or CRANK PINS made to order. May22:1y

---

THE NOVELTY IRON-WORKS.

(Foot of East Twelfth street.)

BRANCH OFFICE, Nos. 77 AND 83 LIBERTY STREET,

Manufacture

**ACHITECTURAL IRON-WORK**

OF ALL KINDS.

feb 1-1y

---

MERRICK & SONS'

Southwark Foundry,

No. 430 WASHINGTON AVENUE, PHILADELPHIA.

William Wright's Patent Variable Cut-Off Steam Engine, regulated by the Governor. Merrick's Safety Grinding Machine. Patents June [illegible] Jarvis etc. Patent Valveless Steam Hammer. D. M. Weston's Patent Self-Centering, Self-Balancing Centrifugal Sugar Draining Machine, and Hydro Extractor for Cotton and Woolen Manufacturers, nov15-1y

## MACHINISTS' SUPPLIES.

ANDREWS'

PATENT

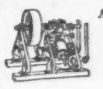
**Engines, Boilers, Pumps, Hoisters,**

OSCILLATING ENGINES, run at great speed. Sizes 1-2 to 250 Horse-Power.

SMOKE-BURNING AND SUPER-HEATING BOILERS are economical and Safe.

CENTRIFUGAL PUMPS, pass Sand, Coal, Corn, Gravel, etc., without injury. Capacity 90 to 40,000 gallons per minute.

HOISTING MACHINES, run without noise; speed changed or reversed instantaneously.



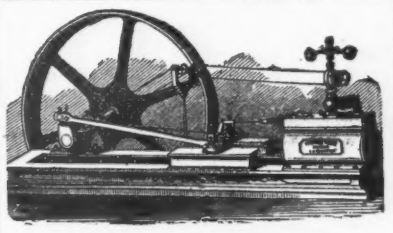
ALL COMPACT, LIGHT, AND DURABLE.

Address Manufacturers

WM. D. ANDREWS & BRO.,

july 1 1-y 414 Water street, New York.

---



TODD & RAFFERTY,

GENERAL

MACHINERY MERCHANTS, ENGINEERS, AND MACHINISTS,

Manufacturers of Stationary and Portable Steam Engines and Boilers; also Flax, Hemp, Tow, Oakum, and

ROPE MACHINERY,

MILL GEARING,

SHAFTING.

Lathes, Planers, Drills, Chucks, etc. Iron and Brass Castings. Judson & Snow's Patent Governors constantly on hand.

OFFICE AND WAREROOMS, NO. 10 BARCLAY STREET, N. Y.

Office and Works, Paterson, New Jersey.

JOSEPH C. TODD. oct-27-tf. PHILIP RAFFERTY.

---

NAHUM PERRY & CO.,

MANUFACTURERS OF

BOILERS, PIPE, FITTINGS, VALVES, COCKS, STEAM PUMPS, &c.

**STEAM and GAS PIPING**

IN ALL ITS BRANCHES.

**PROVIDENCE, R. I.**

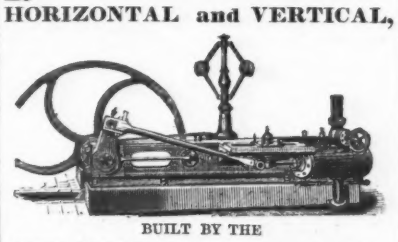
Public Buildings, Stores and Dwellings heated with High or Low Pressure Steam Apparatus.

Sept 28:3m e o w

## ENGINES, IRON WORK, ETC.

RIDER'S PATENT CUT-OFF ENGINES,

**HORIZONTAL and VERTICAL,**



BUILT BY THE

DELAMATER IRON WORKS,

**Foot of West Thirteenth Street,**

*NEW YORK CITY.*

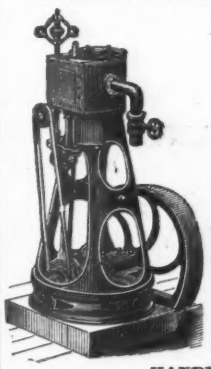
AND BY THE

**Albany St. Iron Works,**

Corner of

**Washington and Albany Streets,**

*NEW YORK CITY.*



**HANDREN & RIPLEY,**

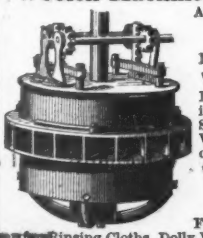
Proprietors.

Also, BOILERS, TANKS, and CASTINGS, of all descriptions. nov 2:1y

---

HUNT, WAITE & FLINT,

Woolen Machine Manufacturers,



And Manufacturers of Upright and Circular Saw Mills,

BREAST AND TURBINE

**WATER WHEELS,**

Regulators, Elevators, Shafting, Gearing, Pulleys, Gate Screws for Hoisting Gates, Woodworth's Planing Machines, Grist Mills, etc., etc.

**Patent Rotary Fulling Mills,**

Hammer Falling Stocks, Fulling Mills, Dusters, Washer and Rinsing Cloths, Dolly Washers for Hosiery Goods, Dolly Washers for Washing Wool, Gigs, Dye Tubs, Bleaching Vats, and Steam Boxes.

Also Iron Founders. Every description of Casting furnished at short notice. All Machines and Castings furnished at this establishment warranted.

june5-tf-q ORANGE, MASS.

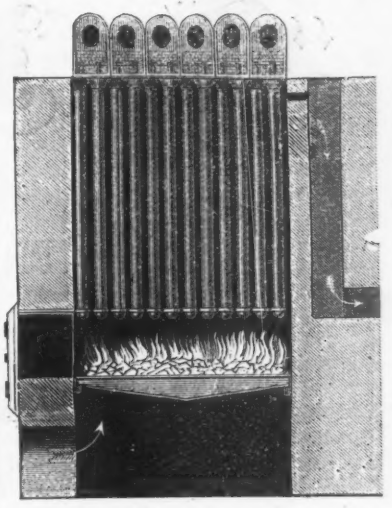
## STEAM BOILERS.

THE STEAM GENERATOR

**Manufacturing Company of Penn**

This Company is now prepared to furnish

WIEGAND'S



**Patent Improved Steam Generator,**

Of any power required, upon two weeks' notice. They have been introduced in this city and thoroughly tested, with most satisfactory results, and are sold under Guarantee of Absolute

**Safety from Destructive Explosion.**

They are cheaper in first cost and in expense of erection, more economical in fuel, durable and convenient in use, than any other apparatus for generating steam. For Mining purposes it is unequalled, owing to the facility with which it can be transported and erected.

Office of the Company, 34 North Fifth Street,

**Philadelphia, Pa.**

Directors—NELSON J. NICKERSON, WALTER J. BUDD EMMOR WEAVER.

NELSON J. NICKERSON, President.

EDWARD H. GRAHAM, Sec. and Treas. sep14-1y

---

WORCESTER STEAM BOILER WORKS, manufacturers of

LOCOMOTIVE, FLUE AND TUBULAR BOILERS, OIL AND WATER TANKS, GASOMETERS, Etc.

WORCESTER, MASS.

N. B.—Boilers inspected and repaired in the best manner and at short notice.

may15-tt CHAS. STEWART, Sup't. D. M. DILLON, Treas.

## SAWS AND PLANERS.

CIRCULAR SAWS WITH EMERSON'S PATENT MOVEABLE TEETH.

These Saws are meeting with unprecedented success, and their great superiority over every other kind, both as to efficiency and economy, is now fully established

Also,

EMERSON'S PATENT PERFORATED CIRCULAR AND LONG SAWS,

(All Gumming avoided,) and

EMERSON'S PATENT ADJUSTABLE SWAGE,

for Spreading, Sharpening, and Shaping the teeth of all Saws. Price, $5. Manufactured by the

AMERICAN SAW COMPANY

Office No. 2 Jacob St., near Ferry St., New York.
Factory, Trenton, N. J. Branch Office for Pacific Coast, No. 606 Front St., San Francisco, Cal.
Send for new Descriptive Pamphlet and Price List.
july1-1y

---

RICHARDSON, MERIAM & CO., Manufacturers of the latest Improved Patent.

DANIELS' & WOODWORTH PLANING MACHINES MATCHING, SASH AND MOULDING, TENONING, MORTISING, BORING, SHAPING, VERTICAL AND CIRCULAR RE-SAWING MACHINES.

Saw Mills, Saw Arbors, Scroll Saws; Railway, Cut-Off, and Rip-Saw Machines; Spoke and Wood Turning Lathes, and various other kinds of Wood-working Machinery.

Catalogues and Price Lists sent on application.
Manufactory, Worcester, Mass.
Warehouse, 107 Liberty Street, New York.
apr24-1y-q

---

ROLLSTONE MACHINE WORKS, Manufacturers of

BAND SAWS, ROTARY BED PLANERS,

Matching Machines, Moulding Machines, Saw Benches, Chair Lathes, Self-Oiling Pulleys, etc.

june5-tf FITCHBURG, MASS.

---

UNITED STATES ASSAY OFFICE,

**No. 30 Wall Street, New York City.**

Gold and Silver Bullion, Jewelry, Foreign Coins, &c., received on deposit in amounts not less than $100 in value, and returns made, as soon as assayed, in coin or fine bars, at the option of the depositor, and on the same conditions as at the U. S. Mint. Bullion sent through the agency of Express Companies should be accompanied by explicit instructions as to return of proceeds.

nov 2:1y GEORGE F. DUNNING, Superintendent.

**1870.** **1870.**

PROSPECTUS OF

# "The Manufacturer and Builder,"

A

PRACTICAL JOURNAL OF INDUSTRIAL PROGRESS.

This Journal has now been before the public for one year, and has won golden opinions from all who have examined it. Prior to its rise, the manufacturing and building interests of the United States were without any direct and adequate representation on the part of the public press. In magnitude and importance, they are second to no others on the continent. In publishing "THE MANUFACTURER AND BUILDER," it has been the aim of the proprietors to give to these interests a full, able and trustworthy representation—to supply, in fact, a want long existing among those engaged in industrial pursuits. As the cause of manufacturing and building is emphatically the cause of SKILLED LABOR, in working for the best interests of the former, the publishers have also advanced those of the latter.

## "THE MANUFACTURER AND BUILDER"

Will therefore be as it has always been, a PRACTICAL Journal, appealing directly to the masses, either engaged or interested in the subjects of which it treats. While it is built up upon a truly scientific basis, the superstructure itself is eminently popular, coming within the easy grasp of every intelligent mind.

Party politics find no place in its columns, although, of course, questions of political economy, in so far as they bear upon the manufacturing and building interests, can not be ignored.

Like its predecessor, the volume for 1870 will contain a large proportion of original matter, prepared by the ablest writers of the day, in which important industrial questions will be carefully considered. It will contain, among others, elaborate articles upon the following subjects, namely:

***The Different Kinds of Manufacturing Machinery;***

***The Manufacture of all Kinds of Materials, either Useful or Ornamental, that enter into the Structure of Buildings;***

***The Stone, Slate, and Marble Interests; Our Extensive Iron and Lumber Interests;***

***The Stability of the Various Kinds of Structures; The more Common as well as the Higher Forms of Architecture; Lime, Mortars, Cements, etc.; Ventilation, Sewage, and Kindred Subjects;***

***Discussions regarding the Character, Strength and Relative Value of Building Materials;***

### HOMES FOR THE MILLION,

INCLUDING PLANS, DETAILS OF CONSTRUCTION, ETC.

Whenever these articles admit of illustration, no expense will be spared in getting up engravings, executed in the very best manner. Each of the numbers issued during the year 1869, contained from twenty to twenty-five engravings, and the volume for 1870 will be illustrated with equal profusion.

It will also contain Notes on NEW DISCOVERIES and IMPROVEMENTS, REVIEWS of NEW PUBLICATIONS; SUMMARY of GENERAL PROGRESS in MANUFACTURING and BUILDING, both at home and abroad; SELECTIONS from the best English, French and German Periodicals; CORRESPONDENCE from the chief Manufacturing centres of Europe and America, keeping our readers well informed in regard to such industrial movements abroad as may have significance in reference to the progress of skilled labor at home; a HOME DEPARTMENT, in which will appear entertaining and instructive descriptions, explanations, etc., especially such as illustrate the applications of science to domestic life.

In a word, it is the intention of the publishers to make the paper, in every sense of the term, what is implied in its name.

It will be printed from new type, upon the best quality of paper, and will contain THIRTY-TWO LARGE QUARTO PAGES of interesting matter, closely printed and neatly put together. The rate of subscription will be continued as heretofore at ***only $1.50 per year.*** It is hoped that this low rate, combined with the merits of "THE MANUFACTURER AND BUILDER," will secure for it success, a wide circulation, and make it welcome in every office, manufactory, workshop, and dwelling of the industrial classes of the community.

Address, **WESTERN & COMPANY, PUBLISHERS,**

37 Park Row, New York.

# "THE MANUFACTURER & BUILDER,"

## ITS GREAT SUCCESS! WHY PEOPLE SUBSCRIBE TO IT!

## CONTENTS FOR ITS FIRST SIX MONTHS.

### Show it to your Friends.

THE success which has attended our efforts to provide a first-class Monthly, devoted to the interests of the industrial classes, has far exceeded our most sanguine anticipations. THE MANUFACTURER AND BUILDER has been received with favor by every class of the community. Manufacturers have taken it for the information which it gives in regard to the improved processes in which they are interested; mechanics have taken it for the instruction which it conveys in regard to matters pertaining to special arts and trades; professional and literary men have taken it for the information which it conveys in regard to the progress of the industrial arts; people, in general, have taken it because it contains much pleasant reading matter for the family circle. That all these classes have been right in their estimate of this journal, will be evident to any one who will read the Table of Contents which we here append. When we state that these articles are almost all derived from original and authoritative sources, it will be seen that we have presented a body of **PRACTICAL, THOROUGH, AND RELIABLE INFORMATION,** such as can nowhere else be obtained for the sum charged for a year's subscription to THE MANUFACTURER AND BUILDER.

***Subscription $1.50 per Annum, with Liberal Club Rates and Premiums.***

## Table of Contents of the First Half-Volume of "The Manufacturer and Builder,"

*[ILLUSTRATED ARTICLES ARE MARKED WITH AN ASTERISK.]*

### JANUARY.


*Gold and Stock Telegraphy, .... 1
Persian Arms, Damask Steel, and Damaskeening, .... 2
How to cause a Tempest in a Teapot, .... 2
The Causes of the Difference in the Color of Bricks, .... 3
How to make different Cements, .. 3
Learned Blacksmiths, .... 3
*Dove-Tail Joints, .... 4
Wall-damp, .... 5
The Utilization of Tin Scraps, .... 6
The Firmness of Paper, .... 6
New City Buildings, .... 7
*Have you ever looked through a Microscope? .... 8
The Mechanic and his Work, .... 8
Reversible Seats, .... 9
Preventive of the Decay of Wood, .. 9
Colorado Manufactures, .... 9
Chemical Engineering, .... 10
The New Art of Fresco-Painting, 10
"Old Says" on Building, .... 11
The Progress of Building, .... 11
Chrome-Yellow Paint, .... 11
*Hints for Sign-Painters, .... 12
Imitation-Marble, .... 13
Common Mortar, .... 13
New Paint for Floors, .... 13
Apatite; Its Importance in Domestic Economy, .... 14
Gun-Cotton, .... 14
The Preservation of Wood by Immersion, .... 14
Ventilation and Heating by Currents, .... 15
Cement and Mortar of the Ancients, .... 15
Bridging the Missouri, .... 16
*The Park Bank Building—A Palace of Finance, .... 17
The Air in Lecture and School-Rooms, .... 18
Prize Problems, .... 19
Glass, .... 19
*Improvement in Saws, .... 20
Hoosac Tunnel, .... 21
*Deep-Sea Cables, .... 22
An Important Invention, .... 22
To the Public, .... 22
Trades' Unions in the United States, .... 23
Literary, .... 23
Mechanics' Homes, .... 24
*Long Island Villa, with Mansard Roof, .... 24
*Villa Cornice Work, .... 25
Chidren's Toys, .... 25
To the Press, .... 26
Occupations and Wages in California, .... 26
Queries, .... 27
Special Notice to Travellers, .... 27
Advertisements, .... 27


### FEBRUARY.


*Portable Wainscoting, .... 33
Ventilation and Warming, .... 34
A Few Words about Bricks, .... 35
*The Bessemer Process and its Late Improvements, .... 35
Wire-Rope, .... 37
Hollow Walls, .... 39
Rock-Drilling Machine, .... 39
Mr. Mudge on Woolen Manufactures, .... 39
*Water-Proofing Dress Goods, .... 40
Insoluble Cements, .... 40
Atmospheric Action on Building-Stones, .... 40
*Anatomy of the Screw, .... 41
Lead Pencils, .... 41
Artificial Light and the Subject of Ventilation, .... 42
Architecture and Civilization, .... 43
Arches—Old and New, .... 43
*Manufacture of Sheet Tin, .... 44
Rates of Travel, .... 44
*Hand-Power Machine, .... 45
The History of Windows, .... 45
To Restore Burnt Cast-Steel, .... 45
To Bleach Palm-Oil, .... 45
The Building-Stone and Slate of Virginia, .... 46
The New-York Milling Interest, .. 47
*The New-City Post-Office, .... 48
Review of City Buildings, .... 50
Decay of Wood and Processes for Preserving it, .... 51
The Daguerrean Process, .... 51
To obtain Different Shades of Chrome-Yellow, .... 52
*Improved Cupola and Blower, .... 52
Literary, .... 54
Real Estate for Workingmen, .... 55
The Philosophy of Building, .... 55
*Villa and Cottage Architecture, 56
Consumption of Milk, .... 57
Trades and Professions, .... 58
Bread-Making, .... 58
Castle-Garden, .... 58
Queries, .... 59
Special Notice to Travellers, .... 59
Advertisements, .... 59


### MARCH.


*Brick-Making, .... 65
Absorbent Capacity of Bricks, .... 66
Lake Colors—Their Nature and Manufacture, .... 67
*Steam-Dredging and the Suez Canal, .... 68
The Selection of Wall-Paper, .... 71
*Marble Paper Manufacture, .... 71
Sand-Grinding Machine, .... 73
*The Gothic Furnace, .... 74
Ventilation and Heating by Currents, .... 74
*The Ventilation and Warming of School-Houses, .... 75
*Iron Buildings, .... 76
Hints on Economic Building, .... 78
Copper and its Alloys, .... 79
Cryolite—Where found, Nature, and Uses, .... 80
Chromo-Orange, .... 80
*Illinois State Capitol Design, .. 80
The Uses of Gun-Cotton, .... 82
Terra Cotta, .... 82
Building-Stones—Their Preservation, .... 82


### APRIL.


*Improvement in Hand-Drills, .. 97
Renovating Silk Hats, .... 97
Memoranda concerning Nails, .... 98
Comparative Weight of Pattern and Castings, .... 98
Flint-Glass, .... 98
Wolfram or Tungsten Steel, .... 99
Cheap Brick Walls, .... 99
*Stereotyping, .... 99
Edge-Tools, .... 102
Road-Dust and Vegetation, .... 102
Aniline Colors, .... 102
Soap-Making in the Olden Time, 103
*Manufacture of Vinegar, .... 104
Textile Fabrics from Glass, .... 104
The Effect of Artificial Light upon the Eyes, .... 105
*The Daguerrean Process, .... 105
Building in California, .... 105
The Piano-Forte, .... 106
The Art of Gilding, .... 106
Ventilation and Warming, .... 107
*Ventilation and Warming of School-Houses, .... 108
*The New-York Fire-Place Heater, .... 109
Cheap Houses—Building on Pisé, .... 110
*The Vermont Slate Industry, .. 83
Literary, .... 86
"Too Many Irons in the Fire," .. 87
The Tinning and Silvering of Looking-Glasses, .... 87
*French Sash-Windows, .... 88
*Whence came our Silks? .... 88
*Cottage and Villa Architecture, 89
What Shall Workingmen Read? .. 90
The Dwarf Builders, .... 90
Nature as a Builder, .... 91
Sharpening Files by Corrosion, .. 92
Queries, .... 92
Special Notices, .... 92
Advertisements, .... 92


### MAY.


*The Telephone, .... 129
Peroxide of Hydrogen for the the Hair, .... 130
The Daguerrean Process, .... 130
Glue, .... 130
How to put a Cross-cut Saw in Order, .... 131
Coraline Dye—Injurious Effects Therefrom, .... 131
Mixing Things Up, .... 131
*On Boiler Explosions, .... 132
How to Repair Chain Pumps, .... 134
New Element, .... 134
*Béton Building, .... 135
Hydraulic Mortar, .... 135
Economic Furniture, .... 111
The Manufacture of Cases for Percussion-Caps, .... 111
*The Thames Embankment, .... 112
*Automatic Indicator for Water and Steam, .... 115
*Winds and Chimney Draughts, 115
*Improved Electric Fuse, .... 116
*Stone-Breaking and Ore-Crushing, .... 117
Literary, .... 118
Are Men Equal? .... 119
Beauty in the Household, .... 119
Coöperation, .... 120
Irish Moss, .... 121
*Cottage and Villa Architecture, 121
Public Baths, .... 121
Manufacture of Brushes, .... 122
A Large Building, .... 122
To Clean Glass, .... 122
How to Make the Peasley Cement, .... 122
Polytechnic Association of the American Institute, .... 122
Manufacturer and Builder at $1.50 per year—How it is Done, 122
Large Cash Premiums, .... 123
Queries, .... 123
Shellac for Water-Proof Coatings, Dyes, Paints, and Printing Inks, .... 136
*Improvement in Billiard Tables, .... 137
Historical Notes on Paper Manufacture, .... 137
Kalsomining Walls, .... 138
A Plea for Stone, .... 138
On Forging, Hardening, and Tempering Mill-Picks, .... 139
Chrome-Yellow Paint Practically Tested, .... 138
*Water-Closets, .... 140


### JUNE.


*Improved Steam Pump, .... 161
What Paint shall we use? .... 162
Varnishes—their Nature and Manufacture, .... 162
Something of practical Importance in the Use of Plaster-of-Paris, .... 163
Influence of Water in the Manufacture of Wax-Leather, .... 163
Why do we Oil our Whetstones? 163
Compressed Leather, .... 163
*The Art of Electrotyping, .... 164
Practical Hints on Working and Tempering Steel, .... 166
Spiritual Photographs, .... 167
"Too Much Pork for a Shilling," 167
Credit to whom Credit, etc., .... 167
Store-Shutters, .... 168
Damp Cellars, .... 168
The Velocipede as a Mechanical Agent, .... 168
Calculating Areas by Weight, .... 168
Aniline Gray, .... 168
The Generation of Oxygen Gas from Sulphuric Acid, .... 168
*On Testing Iron by Magnetism, 169
Blowing a Wine-Glass, .... 169
How Jewelry is Made, .... 170
American Wheels, .... 170
Ventilation and Warming, .... 171
The Manufacture of Pins, .... 171
Right-Handand Left-Hand Locks 171
Lisieux and its Linen Factories, 171
Cleaning Gilded Ware, .... 171
Encaustic Tiles, .... 172
*Salt—its Manufacture and Uses, 172
Paper Belting, .... 173
Vegetable Oils—their Production and Purification, .... 174
Chimneys and Chimney-Shafts, .. 174
Welding Copper, .... 140
The Largest Suspension Bridge, 140
*Improved Hoisting Apparatus, 141
Colored Marbles, .... 141
The Piano-Forte, .... 142
Thames Embankment—South side, .... 142
Seaweed Charcoal, .... 142
Ventilation and Warming, .... 143
The New Metal Hydrogenium, .. 144
Painting Zinc, .... 144
Artificial Alizarine for Coloring, 144
Prisian a little Scratched, .... 144
Suez Canal, .... 144
*The New State Emigrant Hospital, Ward's Island, .... 145
Magenta, .... 145
Varnishes for Iron, .... 147
Ornamental Glass—Opaline and Enamel, .... 147
Ship-Building—Here and in England, .... 147
Industrial Progress, .... 147
A New Ornamental Wood, .... 148
Sprinkling Streets with Deliquescent Salts, .... 148
*Old and New Fire-Grates, .... 148
Effect of Cold upon Tin, .... 148
Cryolite as a Source of Soda, .... 149
Literary, .... 150
Credit, .... 151
On Going Surety, .... 151
Interior Decorations, .... 151
*Church Architecture, .... 152
*Ornamental Work—Ceiling and Railing, .... 153
Purifying Water, .... 154
Adulterations, .... 154
Indelible Inks, .... 154
New Cements, .... 154
Welding Steel to Iron, .... 154
Queries, .... 155
New Advertisements, etc., .... 156


The above speaks for itself. In a period of six months we gave upwards of **500 COLUMNS OF MATTER,** from the pens of the best writers in the country and presented in connection therewith upwards of **150 ENGRAVINGS!** The second half volume is equal to the first half in every respect, and it is our determination, during **1870,** to even surpass all our former efforts and make the MANUFACTURER AND BUILDER **INDISPENSABLE** to every

**MECHANIC, ARCHITECT, BUILDER, ENGINEER, CARPENTER, MACHINIST, AND LABORING MAN IN THE COUNTRY.**

### VOLUME ONE, BOUND

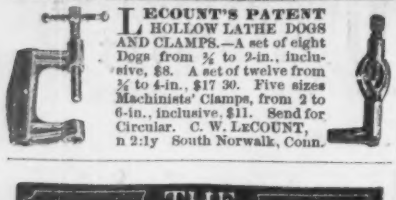
**In Cloth, with Gold Mountings, can be had after Dec. 15th. Price $2.25. Send in your orders at once. Those received in advance will be filled first.**

Address,

## WESTERN & COMPANY, Publishers,

## NO. 37 PARK ROW, NEW YORK.

## MACHINISTS' SUPPLIES.



LECOUNT'S PATENT HOLLOW LATHE DOGS AND CLAMPS.—A set of eight Dogs from ⅜ to 2-in., inclusive, $8. A set of twelve from ⅜ to 4-in., $17 30. Five sizes Machinists' Clamps, from 2 to 6-in., inclusive, $11. Send for Circular. C. W. LECOUNT,
n 2:1y South Norwalk, Conn.

THE CHALMERS-SPENCE PATENT NON-CONDUCTOR FOR COVERING BOILERS ETC.

Also for protecting Water Pipes and Mains from FROST. This Composition is NON-COMBUSTIBLE. It never DETERIORATES, and will last as long as the boiler or pipe to which it is applied. It saves from 20 TO 30 PER CENT. in fuel according to circumstances. This has been practically demonstrated. Steam passes through ANY LENGTH of piping covered with this Composition QUITE DRY.

Extensively used in the British Navy and by the leading Manufacturers, Shipbuilders, and Steamship Companies of Great Britain and the Continent; and since its introduction in America it has given universal satisfaction. In witness whereof see pamphlet containing names and testimonials, to be had by applying to the only manufacturers in this country,

J. & J. CHALMERS,
Foot of East Ninth street, New York.

Or, to E. H. Ashcroft, Boston, Agent for New England; L. M. Hart, 522 Walnut street, Philadelphia; F. A. Shuck, 34 Peter's street, New Orleans; J. Kupferle & Co., St. Louis, Mo. nov. 30-3m

NEW YORK BELTING AND PACKING COMPANY. The oldest and largest manufacturers in the United States of

**Vulcanized Rubber Fabrics,**

Adapted to Mechanical Purposes,

invite the attention of all who are interested in the sale or use of such articles to the high standard quality and low prices of their various manufactures, comprising

Machine Belting, Steam Packing, Leading Hose, Suction Hose, Car Springs, Wagon Springs, Billiard Cushions, Grain Drill Tubes,
etc., etc., etc.,

**"TEST" HOSE**

made expressly for the use of Steam Fire Engines, and will stand a pressure of 400 pounds per square inch. Officers of Fire Departments requiring new hose, will find this much superior in strength and quality to any other.

PATENT SOLID EMERY VULCANITE WHEELS, a composition of rubber and emery, making a very hard uniform substance of the nature of stone throughout. These wheels for grinding and polishing metals, "gumming" saws, etc., are the most economical and effective tools that can be used.

WAREHOUSE, 37 AND 38 PARK ROW, NEW YORK.

JOHN H. CHEEVER, Treasurer.

☞Price lists and further information may be obtained by mail or otherwise on application.
oct30 1y-os

PROVIDENCE TOOL COMPANY,
PROVIDENCE, R. I. [*Established* 1845.]
Manufacturers of Nuts and Washers, Bolts, Chain Links, Pick Axes, Can Rings, Plate Hinges, Threshing-Machine Teeth, Hooks and Thimbles, Cinch Rings, Connecting Shackles, Ship Scrapers, Marlin Spikes, &c., &c. Police Hand-Cuffs and Ankle Shackles, Cast Steel Hammers.

NEW YORK WAREHOUSE, 29 BEEKMAN STREET.

H. B. NEWHALL,
Sept. 28:tf Agent.

LUCIUS W. POND'S NEW TOOLS.

NEW AND IMPROVED PATTERNS—Lathes, Planers, Drills, Milling Machines, Boring Mills, Gear and Bolt Cutters, Punches and Shears for Iron. Dealer in

IRON & WOOD WORKING MACHINERY

☞Works at Worcester, Mass. Office, 98 Liberty St., New York.
aug4-1y-os S. N. HARTWELL, General Agent.

GALLATIN & BREVOORT

**MACHINE WORKS,**

223 FRONT STREET, NEW YORK.

**SHAFTING PULLEYS and HANGERS**

of the best quality on hand and to order.

**Craig's Patent Oscillating Engines,**

with Balanced Valve and Adjustable Cut-off.

Sept 28-3m:o.s.

THE LAST AND THE BEST!

**MASSEY'S**

**High and Low-Water Detector.**

Patented in the United States, England and France.

perfectly simple and reliable instrument for PREVENTING EXPLOSION OR BURNING OF STEAM BOILERS.

PRICES, $25, $30, $35, and $40, according to finish. Every instrument warranted in every respect.

This Detector requires no adjusting after being applied to the Boiler, and

*CANNOT BE TAMPERED WITH.*

It may be applied on top, or in a separate chamber, at the end of the Boiler. Address,

J. W. BLAKE & CO., General Agents,
Dec. 7:4t 389 Broadway, New York.

ADOLPH OTT,
CHEMICAL ENGINEER,

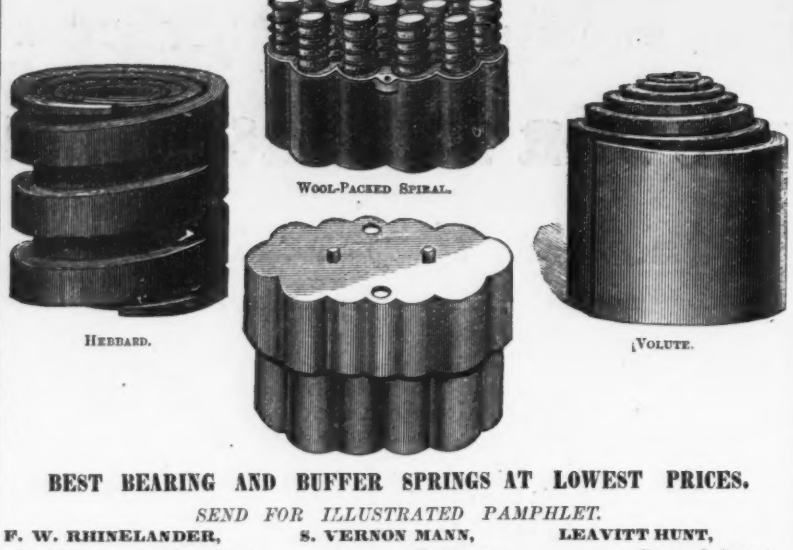
May be employed professionally as an expert on practical subjects, involving both Chemical and Mechanical knowledge. A specialist in various branches of technology. Assays and Analyses of all kinds. Address, Editorial Rooms of the "Engineering and Mining Journal," 37 Park Row, New York City.

☞Written communications preferred. nov28-tf

## CAR SPRINGS.

**UNION CAR SPRING MANUFACTURING CO.,**

**4 Dey Street, New York.**



WOOL-PACKED SPIRAL.

HEBBARD. VOLUTE.

**BEST BEARING AND BUFFER SPRINGS AT LOWEST PRICES.**

*SEND FOR ILLUSTRATED PAMPHLET.*

F. W. RHINELANDER, President. S. VERNON MANN, Treasurer. LEAVITT HUNT, General Agent.
Dec.14

## MACHINISTS' SUPPLIES.

WOOD, LIGHT & CO.,

Manufacturers of

**IMPROVED LATHES,**

FOR TURNING SHAFTING.

IMPROVED COUPLING BOX,

with Locks on Shaft for connecting Shafting; and

IMPROVED BOLT CUTTER.

Persons purchasing Shafting, or engaged in its manufacture, or having use for a Bolt-Cutter, should examine these improvements, before purchasing elsewhere.

☞Warehouse, 107 Liberty Street, New York City.

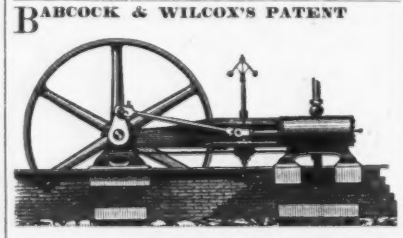
☞Manufactory, Junction Shop, Worcester, Mass.
april24-1y-q

## ENGINEERS' SUPPLIES.

**Leschot's Patent DIAMOND-POINTED STEAM DRILLS.**

adapted to every variety of ROCK-DRILLING. The unequalled efficiency and economy of these Drills are now acknowledged both in this country and Europe. The reputation which they acquired at the Mont Cenis Tunnel, has been sustained by their complete success in the mines and quarries of this country. These Drills are built of various sizes and patterns, both with and without boilers, and bore from one to six (1 to 6) holes at a time, at a uniform rate, per hole, of three to five (3 to 5) inches per minute in hard rock; eight to ten (8 to 10) inches per minute in slate; and sixteen to twenty-two (16 to 22) inches per minute in coal. They are adapted to Channelling, Gadding, Shafting, Tunneling, and open cut work; also to deep boring for testing the value of mines and quarries. TEST CORES, in the form of solid cylinders of rock or mineral, are taken out by the "Prospecting Drill," showing the character of mines at any depth. Used either with steam or compressed air. Simple and durable in construction. Never need sharpening, as the points *composed of rough uncut diamonds*) are practically indestructible. Manufactured only by SEVERANCE & HOLT,
aug11-1y Office, 16 Wall St., New York.

BABCOCK & WILCOX'S PATENT



**STATIONARY STEAM ENGINES,**

Received the FIRST PREMIUM at the FAIR OF THE AMERICAN INSTITUTE, 1869, for the MOST PERFECT AUTOMATIC EXPANSION VALVE GEAR, in competition with the Corliss and other engines.

They are unequalled for

ECONOMY OF FUEL, REGULARITY OF SPEED, AND SIMPLICITY OF MECHANISM.

BABCOCK & WILCOX'S PATENT TUBULOUS BOILER is superior to all others in

ECONOMY, EFFICIENCY, DURABILITY, AND SAFETY.

Send for Circular.

BABCOCK, WILCOX & CO.,
sep7-1y os No. 44 CORTLANDT STREET, New York.

**GUN-POWDER**

THE LAFLIN & RAND POWDER CO., 170 BROADWAY, NEW YORK, deliver Mining, Blasting, and Sporting Powder, from their Agencies in all parts of the United States, and their Works at Kingston, Newburg, Saugerties, and Catskill, N. Y., Pottsville, Carbondale, and Scranton, Pa., Baltimore, Md., and Platteville, Wis.

☞Safety Fuse at Wholesale. nov 2:1y

## ENGINEERS' SUPPLIES.

**B. F. STURTEVANT'S NEW PATENT IMPROVED FAN PRESSURE BLOWERS**

AND MANUFACTORY & SALESROOM
72 SUDBURY ST. BOSTON.

feb13-1y-os

RAILROAD IRON FOR MINES.

Stock Constantly on Hand of any weight and pattern, and sold in lots to suit purchasers. Also, Chairs, Spikes and Fish Joints for same.

DANAS & LITCHFIELD, (P. O. Box 5489.) 18 WILLIAM ST., NEW YORK.

FOR SALE BY

Light Locomotives, for use in Collieries, Mines, etc.
mch13-6m

HEBBARD CAR SPRING CO., Manufacturers of Patent Right and Left Spiral

**Steel Car Springs.**



M. B. WASHBURN,

*General Agent,*

137 and 141 Elm Street, New York City.
jan23-1y-isq

GUNPOWDER PILE-DRIVER—THOMAS SHAW PATENT.—The Company are prepared to sell rights, or machines, or will contract for driving piles quicker and better than it can be done by any other machine.

**Fifty Blows Per Minute and no Crushing or Shattering.**

For description and illustration see this Journal of August 17,th, Vol 8, No. 7. Address

GUNPOWDER PILE-DRIVER,
aug 21-1y o. Nos. 505 Minor street, Philadelphia.

**UTICA STEAM GAUGE CO.**

MANUFACTURERS OF

**STEAM VACUUM AND WATER GAUGES,**

BOILER FEEDERS AND ENGINE ROOM FIXTURES.
No. 8 CORNELIA Street, Utica, N. Y.

☞Send for Circular, sep6-6m

## ENGINEERS' SUPPLIES.

**WIRE ROPE**

MANUFACTURED BY
JOHN A. ROEBLING'S SONS,
TRENTON, N. J.
FOR

Inclined Planes, Mining,
Standing Ship Rigging,
Suspension Bridges, Ferries,
Stays and Guys on Bridges,
Cranes and Shears,
Derricks, Tillers, etc.

A large stock of Wire Rope constantly on hand. Orders filled with dispatch.

☞For strength, size, and cost, see circular, which will be sent on application. dec26-tf

**STEAM ENGINES**

FROM 4 TO 500 HORSE-POWER,

Including CORLISS PATENT CUT-OFF ENGINES, SLIDE VALVE STATIONERY ENGINES, and PORTABLE ENGINES. Also, IMPROVED CIRCULAR SAW MILLS, etc.

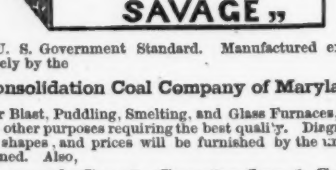
Send for Descriptive Circular and Price List.

WOOD & MANN STEAM ENGINE CO.,
UTICA N. Y.

Warerooms, 42 Cortlandt Street, New York; and 201 and 203 South Water Street, Chicago, Ill.
nov7-1y-os

## MISCELLANEOUS.

**FIRE-BRICK.** TRADE MARK.




U. S. Government Standard. Manufactured exclusively by the

**Consolidation Coal Company of Maryland,**

For Blast, Puddling, Smelting, and Glass Furnaces, and all other purposes requiring the best quality. Diagrams of shapes, and prices will be furnished by the undersigned. Also,

**George's Creek Cumberland Coal**

by the cargo from the Company's

OCEAN MINES.

C. H. DALTON, Pres. 4 Pemberton Sq., Boston. | J. S. MACHIR, V. Pres. 71 Broadway, New York.

JAMES A. MILLHOLLAND, 2d V. Pres. Mount Savage, Maryland.

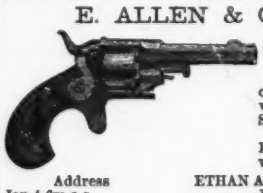
GILMOR MEREDITH, 25 South Gay street, Baltimore.
Dec. 7.tf

**MINNESOTA AS IT IS, IN 1869.**

Just published, 300 pages, 12 mo., with a colored map of the State, handsome engravings, official descriptions by Geologists, Topographical Engineers, and others, of the SOIL, CLIMATE, MINERAL REGIONS, AGRICULTURAL RESOURCES, SCENERY, Population, Nationality, Railroads, Pineries, and general ATTRACTIONS OF THE STATE FOR FARMERS, MECHANICS, INVALIDS, TOURISTS, CAPITALISTS, and BUSINESS MEN, with special descriptions of EVERY TOWN AND COUNTY where the Government Lands lie; Laws and Methods of Homestead and Pre-emption Claims; Sketches of INDIAN LIFE, CUSTOMS, RELIGIOUS NOTIONS and MISSIONS; Schools, Churches, and Social Life of the State; how to use Money to advantage; all about BRITISH AMERICA, WINNIPEG, and THE SEAT OF THE REBELLION, and EVERY SUBJECT OF INTEREST TO THOSE LOOKING WESTWARD.

Price of Book and Maps, cloth binding, $2 25; paper, $1 75; without map 50 cents less. Sent by mail on receipt of price. J. W. McCLUNG,
Jan 4-tf o.s St. Paul, Minn.

E. ALLEN & CO.'S



NEW MODEL **Cartridge Revolver.**

Weight only 6 oz. can be carried in the vest pocket. Seven Shots, 22-100 cal. Lightest and best Revolver in the world.

Address ETHAN ALLEN & Co.,
Jan 4-6m o.s Worcester, Mass.

RIGGS' **BELMONTYLE OIL,** PREVENTS **Rust, Tarnish, &c** Send for Circular to H. B. RIGGS,

**150 Front Street, New York.**

Dec 21-8t o.s.

WANTED—TWO PRACTICAL MINERS, well versed in mining, and able to take in all its branches: Timbering ground, fixing plungers, and drawing pumps. Accustomed to lead, copper, and gold mines. Seek for a place as foremen, Underground Agents, or otherwise. Willing to take any contracts. Good testimonials if required. Address W. R. D., Box 223, Middle Granville, Washington, Co., N. Y.
Dec 28-3t o.s.

FILE-COVERS. FILE-COVERS. For preserving the numbers of the ENGINEERING AND MINING JOURNAL. Price $1 50. For sale by WESTERN & CO., 37 Park Row, New York.

WOOD ENGRAVING

EXECUTED AT THE OFFICE OF

**The Engineering and Mining Journa**

No. 37 PARK ROW, NEW YORK CITY.

MAGIC LANTERNS FOR SUNDAY Schools, Academies, Public Exhibitions, and Parlor Entertainments. Illustrated priced catalogues sent free. T. H. McALLISTER, Optician,
Dec 21.6m 49 Nassau street, N. Y.

MICROSCOPES FOR SCIENTIFIC INVESTIGATIONS and Educational Purposes. Price list sent free. T. H. McALLISTER, Optician,
Dec 21-6m 49 Nassau street, N. Y.